U.S. DEPARTMENT OF THE INTERIOR
Bureau of Reclamation
Upper Colorado Region
Albuquerque Area Office
Albuquerque, New Mexico

North I-25
Industrial Recycling Project

Draft Environmental Assessment

Prepared by:

THE BUREAU OF RECLAMATION

and

THE CITY OF ALBUQUERQUE,
PUBLIC WORKS DEPARTMENT

May 1999

Draft Environmental Assessment

Project Name:

North I-25 Industrial Recycling Project

Applicant:

City of Albuquerque,
Public Works Department

Location:

Bernalillo County, New Mexico

Lead Agency:

U.S. Department of the Interior,
Bureau of Reclamation

May 1999

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SUMMARY

The City of Albuquerque, New Mexico proposes to develop a water reclamation project to service a portion of the City with non-potable water that would be reclaimed from industrial uses and used for turf irrigation and industrial processes, as part of its Water Resources Management Strategy (AWRMS). The City's proposed reclamation and reuse project will help the City move toward a more sustainable water supply. This Environmental Assessment addresses the potential effects of implementing the project.

The purpose of the proposed project is to develop a City-owned and operated, reclaimed, non-potable water collection, storage, disinfection, and distribution system that would replace the use of approximately 964 to 1,132 acre-feet per year of ground water currently being obtained from the Santa Fe Group aquifer system. The use of reclaimed water for non-potable purposes would preclude the need to withdraw an equivalent net amount of ground water from the aquifer. This project is needed to reduce the withdrawal of ground water from the aquifer. The proposed federal action for the project is to provide federal financing as authorized by Reclamation Title XVI program to partially support the planning, feasibility analysis, engineering, design, environmental compliance, and construction of the project.

Two action alternatives for the proposed project were defined. The proposed alignment, Alternative A, would build a system to collect, convey, and distribute the reclaimed water to users, routing the distribution system primarily in utility corridors along public rights-of-way. The arroyo alignment, Alternative B, would use a similar system of collection, storage, and distribution facilities to service the same group of open space areas and commercial users, but would route a greater proportion of the total pipeline through undeveloped open space rather than through residential and business areas. The third alternative is the No Action alternative. Under this alternative the City would not build the proposed project. As a result, ground water withdrawals would not be reduced.

Based on the results of agency and public scoping, the following resource areas were evaluated in detail to respond to issues identified for the proposed development projects and the No Action alternative: aesthetics/visual resources; air quality; biological resources; cultural resources; Environmental Justice, human health and safety; Indian Trust Assets, noise and vibration; socioeconomic factors; soils and vegetation; traffic and circulation; and surface and ground water quality and quantity. Environmental commitments were identified for the proposed development projects in each resource area, as applicable.

Mitigation measures were identified for the Biological Resources and the Cultural Resources issue areas. Mitigation measures for Biological Resources included the requirement to create suitable winter habitat for the endangered Rio Grande silvery minnow, to avoid and minimize the effect of a potential downstream depletion in flows in the Rio Grande as a result of implementation of the proposed project. Mitigation measures for Cultural Resources included the requirement for avoidance of resources encountered during construction by project realignment or by documentation of the resources through implementation of an approved recovery plan.

With the implementation of the environmental commitments identified for each resource area, no substantial net adverse environmental effects were identified.

A beneficial effect of the project was identified, reducing net groundwater withdrawals by up to 448 acre-feet per year, and as much as 22,400 acre-feet over the operational life (50 years) of the proposed project.

Comparing the type, number, and magnitude of changes attributed to each alternative indicated that the No Action alternative is the environmentally-preferred alternative, followed by Alternative A. Alternative B is the least preferred alternative. The differences in effects between Alternatives A and B are relatively small.

While the No Action alternative results in the least overall environmental change, it is not recommended, as it does not meet the City objective of developing an alternative non-potable water supply to meet non-drinking water demands. This alternative water supply is the proposed first step in the implementation of the recommendations of the AWRMS for implementing a conjunctive use management approach as the basis for reducing demand on the ground water aquifer and providing a sustainable water supply, and preserving the ground water aquifer as a primary drought reserve. The incremental effect of reducing ground water withdrawals by using reclaimed industrial process water as an alternative source is considered a beneficial effect to future water supply sustainability.

There were no identified effects to Indian Trust Assets or Environmental Justice as a result of implementing the recycling project.

The Environmental Assessment details the agency contacts and consultations that provided information for the completion of the analysis, provides details regarding the agency and public scoping that was conducted, and indicates the manner in which notification of the scoping meetings and distribution of the EA were conducted.

TABLE OF CONTENTS

SUMMARY S-1

TABLE OF CONTENTS
Contents ii
Appendices iii
List of Figures iii
List of Tables iv

LIST OF ACRONYMS AND ABBREVIATIONS v

1.0 PURPOSE AND NEED
1.1 Background 1
1.2 Purpose of the Proposed Project 2
1.3 Need for Project 2
1.4 Federal Action Required 2

2.0 PROPOSED ACTION AND ALTERNATIVES
2.1 Summary of Effect and Evaluation of Alternatives 3
2.2 Development of Project Alternatives 3
2.3 Alternatives Screened from Further Consideration 8
2.4 Description of Alternatives 10
2.4.1 Alternative A, the Proposed Project 12
2.4.2 Alternative B, the Arroyo Alignment 14
2.5 Features Common to Alternatives A and B 14
2.6 No Action Alternative 15

3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES
3.1 Evaluation of Environmental Resources 18
3.2 Environmental Effects Analysis Approach 19
3.3 Environmental Commitments for the Project 20
3.4 Area of Evaluation 20
3.5 Water 21
3.6 Aesthetics/Visual Resources 28
3.7 Traffic and Circulation 30
3.8 Biological Resources 33
3.9 Soils and Vegetation 37
3.10 Cultural Resources 41
3.11 Socioeconomic Factors 45
3.12 Noise and Vibration 47
3.13 Human Health and Safety 50
3.14 Indian Trust Assets 53
3.15 Air Quality 54
3.16 Environmental Justice 56
3.17 Cumulative Effects 57

TABLE OF CONTENTS (Continued)

4.0 ENVIRONMENTAL COMMITMENTS 59

5.0 CONSULTATION AND COORDINATION
- 5.1 Contacts with Agency Personnel 64
- 5.2 Resource Issues Identified During Scoping 65
- 5.3 Formal Recommendations by Agencies or Organizations 66
- 5.4 Notification 66
  - 5.4.1 Newspaper and Other Notifications 66
  - 5.4.2 Scoping Meetings 66
- 5.5 Public Information 67
- 5.6 Distribution Lists 67

6.0 REFERENCES
- 6.1 References Cited 69
- 6.2 Other Sources of Information 72

7.0 LIST OF PREPARERS 73

Appendices

A Applicable Laws and Regulations
B Scoping Summary
C Distribution of the Draft Environmental Assessment
D Environmental Criteria Resulting in Zero Quantities Used in the Effects Evaluation
E Cumulative Effects Analysis
F Consultation Letters - Indian Trust Assets
G Consultation Letter - Endangered Species Act Section 7

List Of Figures

1 Potential Non-potable Water Users, North I-25 Corridor Non-potable Water System 9
2 Reuse Pipeline Alignment Alternative A 13
3 Reuse Pipeline Alignment Alternative B 16
4 Schematic of Project Impacts to Flows in the Rio Grande 26
5 Potential Future Effects of the 1960s Plan: Water Level Declines in the Albuquerque Metropolitan Area 48

TABLE OF CONTENTS (Continued)

List Of Tables

2.1-1 Summary of Environmental Effects and Evaluation and Evaluation of Alternatives 4
2.2-1 Summary of Features for Alternatives A and B 7
2.4-1 Potential Non-Potable Turf Irrigation and Industrial Water Users 12
2.4-2 Linear Feet of Pipeline and Asphalt Removal for Alternative A 15
2.4-3 Linear Feet of Pipeline and Asphalt Removal for Alternative B 17
3.1-1 Resource Areas and Issues Addressed in the EA 18
3.5-1 Summary of Anticipated Effects to Water 24
3.5-2 Effect on Rio Grande Flows from Implementation of the Proposed Recycled Water Project 25
3.5-3 Comparison of Recycled Industrial Water and New Mexico Ground Water Discharge Limits 27
3.6-1 Summary of Anticipated Effects to Aesthetics and Visual Resources 30
3.7-1 Summary of Anticipated Effects to Traffic and Circulation 32
3.8-1 Federally-listed Endangered, Threatened and Candidate Species for Bernalillo County 34
3.8-2 State-listed Endangered and Threatened Species for Bernalillo County 34
3.8-3 Summary of Anticipated Effects to Biological Resources 36
3.9-1 Summary of Anticipated Effects to Soils and Vegetation 40
3.10-1 List of Previously-Recorded Cultural Resources Sites Within 1 mile of the Pipeline Corridor 43
3.10-2 Summary of Anticipated Effects to Cultural Resources 44
3.11-1 Summary of Anticipated Effects to Socioeconomic Conditions 47
3.12-1 Summary of Anticipated Effects to Noise and Vibration 49
3.13-1 Summary of Anticipated Effects to Human Health and Safety 51
3.13-2 Comparison of Recycled Industrial Water Quality and Drinking Water Standards 52
3.15-1 Summary of Anticipated Effects to Air Quality 56
4-1 Environmental Commitments 59
7-1 Preparers of the Environmental Assessment 73

A-1 Project Permits Required A-2
E-1 Summary of Planned or Ongoing Projects in the Rio Grande Basin E-1
E-2 Determination of Potential Cumulative Effects of Planned and Ongoing Projects in the Rio Grande Basin on Environmental Resources E-6

LIST OF ACRONYMS AND ABBREVIATIONS

ac-ft	acre-foot (feet)
ac-ft/mo.	acre-foot (feet) per month
ac-ft/yr.	acre-foot (feet) per year
ACC	Albuquerque City Code
AD	*anno domini*
AMAFCA	Albuquerque Metropolitan Arroyo Flood Control Authority
AWRMS	Albuquerque Water Resources Management Strategy
BMP	best management practices
City	City of Albuquerque
EA	Environmental Assessment
EPA	Environmental Protection Agency
GPPAP	Ground Water Protection Policy and Action Plan
GWDP	Ground Water Discharge Plan
LA	Laboratory of Anthropology, New Mexico Historic Preservation Division
MRGCD	Middle Rio Grande Conservancy District
MG	million gallon(s)
mg/L	milligrams per liter
mmhos/cm	millimhos per centimeter
NEPA	National Environmental Policy Act
NMAC	New Mexico Administrative Code
NMED	New Mexico Environment Department
Reclamation	Bureau of Reclamation
SAR	sodium adsorption ratio
SHPO	New Mexico State Historic Preservation Office
TDS	total dissolved solids

SECTION 1

PURPOSE AND NEED

The City of Albuquerque (City), New Mexico and the Bureau of Reclamation propose to develop a water reclamation project to service a portion of the City with non-potable water that would be reclaimed from industrial uses. The following environmental assessment (EA) addresses the potential effects of implementing the project. This section presents the purpose and need for the proposed project and identifies the federal action required to implement the project.

1.1 BACKGROUND

Historically, the City and other water users in Bernalillo County have relied solely on a deep aquifer, the Santa Fe Group aquifer system, for their water supply. This resource is part of a regional aquifer called the Albuquerque ground water basin. Aquifer studies conducted during the 1950s and 1960s indicated that the aquifer was extensive, and that flows in the Rio Grande recharged the aquifer sufficiently to allow extensive withdrawals without affecting the aquifer's long-term ability to supply water. However, recent studies by the U.S. Geological Survey (USGS 1995) indicated that the City's primary water supply aquifer is being depleted at a rate that is twice that of the recharge to the aquifer from the Rio Grande and other minor (compared to the Rio Grande) sources.

In 1997, the City adopted the Albuquerque Water Resources Management Strategy (AWRMS) (CH2M Hill, 1997a, 1998b, and 1999). The AWRMS is based on optimizing the City's use of existing water resources and developing new surface water supplies. The strategy is intended to provide a sustainable water supply for the City by minimizing the continued pumping and sole reliance on ground water resources. The AWRMS includes using non-potable water from reclaimed industrial wastewater and other low-quality water sources to irrigate large turf areas and for industrial purposes. The non-potable water would replace the use of higher quality aquifer water that is currently provided by the City or by private wells. This would reduce the rate of water removal from the deep aquifer and enhance the sustainability of the existing ground water supply.

One potential source of non-potable water that was identified by Philips Semiconductors (CH2M Hill, 1996, 1998a) and the AWRMS is industrial wastewater from the manufacture of silicon chips. These processes use deep aquifer water that is purified by reverse osmosis for product washing operations. This wastewater is very suitable for use in other industrial processes such as wallboard manufacture, dust control, cement mixing, and cooling tower makeup water, and for turf irrigation.

Currently, this wastewater is discharged to the City's wastewater system and conveyed to the Southside Water Reclamation Plant for treatment and discharge to the river. The proposed project would make this water available for other uses. The project is sponsored by the City and consists of the North I-25 industrial recycling system. The details and feasibility of this proposed project are described in the *Industrial Recycling Project Feasibility Study* (CH2M Hill, 1999).

1.2 PURPOSE OF THE PROPOSED PROJECT

The purpose of the proposed project is to develop a City-owned, reclaimed, non-potable water collection, storage, disinfection, and distribution system. This system would replace the use of approximately 964 to 1,132 acre-feet per year (ac-ft/yr.) of ground water currently being obtained from the Santa Fe Group aquifer system. The use of reclaimed water for non-potable purposes would preclude the need to withdraw an equivalent net amount of ground water from the aquifer.

1.3 NEED FOR PROJECT

This project is needed to reduce the withdrawal of 1,132 ac-ft./yr ground water from the aquifer. This project is the first step of several water supply components that would be developed to ensure a sustainable and dependable public water supply. Without this and future projects the effect to the aquifer would be catastrophic.

The projected annual average demand for reclaimed water in the service area is 1,533 ac-ft/yr. (1.6 mgd). The proposed project would provide up to 1,132 ac-ft/yr. (1.01 mgd) to meet this demand. This project is the first of three non-potable water reclamation projects designed to provide an average annual total supply of 12,800 ac-ft/yr. for City water users. The City has identified 12 locations totaling 356 acres that could be irrigated with reclaimed water by the proposed project. These areas could use as much as 1,052 ac-ft/yr. (0.94 mgd) of water annually based on average daily water use amounts (CH2M Hill, 1999).

Information developed for the AWRMS indicated that without changes to the water supply sources, the City would realize a shortage of potable water of more than 100,000 ac-ft/yr. in the year 2060 (CH2M Hill, 1997c). The proposed project would provide up to 1,132 ac-ft./yr., or 2.8 percent of this deficit.

1.4 FEDERAL ACTION REQUIRED

Public Law 102-575, Title XVI, Section 1621, as amended by Public Law 104-266, and Public Law 105-62, Section 506 authorizes Reclamation to provide cost sharing for water reclamation and reuse projects. Reclamation has received an appropriation of $4,650,000 for implementation of several water reclamation and reuse projects as identified in the AWRMS. Reclamation will provide financial contribution subject to appropriations by Congress, not to exceed 25 percent of the total project costs to support feasibility studies and planning, engineering, design, environmental compliance, and construction of the proposed project. The City is required to contribute at least 75% of the project cost. These funds may be obtained from any non-Federal source. The estimated total cost of the Industrial Recycling Project is $5 million. Special conditions or obligations associated with the funds are the demonstration of financial capability to finance the non-Federal share, Department of the Interior approval of the cost-share agreement, preparation of a Feasibility Study that addresses the requirements of Title XVI, and compliance with the requirements of the National Environmental Policy Act (NEPA).

This EA discloses the potential effects if federal funds are used to develop the project, and the implications of those effects to the human and natural environments. Reclamation will take this action after compliance with NEPA requirements has been demonstrated and the City has completed all other required procedures and applications. Permits required for project implementation are identified in Appendix A.

SECTION 2

PROPOSED ACTION AND ALTERNATIVES

2.1 SUMMARY OF EFFECT AND EVALUATION OF ALTERNATIVES

Table 2.1-1 summarizes the environmental effects of the Alternative A – Proposed Action, Alternative B – Arroyo Alignment, and the No Action alternative. For each listed effect for which there is a quantitative determination of effect, the alternative responsible for the greatest change within the resource category is marked with a (**). The alternative causing the least change is marked with a (*). A relative ranking of the alternatives, based on the total occurrence of "least change" and "greatest change" rankings for each criterion for each alternative, is presented at the end of Table 2.1-1. This ranking represents the results of the environmental evaluation only. The sum of the total occurrences of "least change" and "most change" rankings for each alternative in Table 2.1-1 indicates that the No Action alternative has the greatest occurrence of "least change", and the fewest occurrences of "most change", and is the environmentally-preferred alternative. Alternatives A and B have a similar number of occurrences of "least change" and "most change".

The principal difference between the two action alternatives is the length of construction required for the distribution pipeline. Alternative B requires a pipeline length that is 28 percent greater than Alternative A. The location and length of the distribution pipeline determines to a great extent the magnitude of effects to such resource areas as air quality, cultural resources, noise, and traffic. On the basis of its shorter required pipeline length, Alternative A is selected as the preferred development alternative. This alternative best suits the objectives of the proposed project. Alternative B is the least-preferred alternative. However, the evaluation indicates that there is very little relative difference between the two project action alternatives.

While the No Action alternative results in the least overall environmental change, it is not recommended, as it does not meet the City objective of developing an alternative non-potable water supply to meet non-drinking water demands. This alternative water supply is the proposed first step in the implementation of the recommendations of the AWRMS for implementing a conjunctive use management approach as the basis for reducing demand on the ground water aquifer and providing a sustainable water supply, and preserving the ground water aquifer as a primary drought reserve. The incremental effect of reducing ground water withdrawals by using reclaimed industrial process water as an alternative source is considered a beneficial effect to future water supply sustainability.

2.2 DEVELOPMENT OF PROJECT ALTERNATIVES

The proposed action and two alternatives are described in this section. The range of alternatives considered for this project include:

- the proposed project, identified as Alternative A;
- a project alternative using a different pipeline network arrangement, identified as Alternative B, the arroyo alignment; and
- the No Action alternative.

TABLE 2.1-1
SUMMARY OF ENVIRONMENTAL EFFECT AND EVALUATION OF ALTERNATIVES

ENVIRONMENTAL EFFECT	ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE No Action
Water			
1. Total quantity of wastewater requiring treatment at City wastewater treatment facility (acre-feet per year).	0* [a/]	0*	1,132** [a/]
2. Percent reduction of flow in the Rio Grande during low flow periods as a result of using reclaimed wastewater for turf irrigation and other uses.	0.19**	0.19**	0*
3. Percent reduction in flow from the City's wastewater treatment plant discharged to the Rio Grande (annual average).	1.8**	1.8**	0*
4. Total net quantity of ground water removed from ground water aquifer for non-potable use (acre-feet per year)	0*	0*	448**
5. Number of water quality parameters exceeding state ground water concentration standards.	1**	1**	0*
Aesthetics and Visual Resources			
1. Approximate number of households within 0.25-mile radius of a reservoir that would have an unobstructed view of a new structure.	25**	25**	0*
2. Number of public use areas (parks) within 0.25-mile that would provide an unobstructed view of a new structure.	2**	2**	0*
Traffic and Circulation			
1. Number of intersection crossings (constructed or bored).	6**	5	0*
2. Length of pipeline to be installed in 2-lane streets (linear feet).	11,600	12,700**	0*
3. Length of pipeline to be installed in 4-lane streets (linear feet).	7,700**	3,800	0*
Biological Resources			
1. Total number of federal-listed species that are potentially affected.	1**	1**	0*
2. Total number of state-listed species that are potentially affected.	1**	1**	0*
3. Net reduction of flow in the Rio Grande during low flow periods as a result of using reclaimed wastewater for turf irrigation and other uses (percent).	0.19**	0.19**	0*

TABLE 2.1-1 (continued)
SUMMARY OF ENVIRONMENTAL EFFECT AND EVALUATION OF ALTERNATIVES

ENVIRONMENTAL EFFECT	ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE No Action
Soils and Vegetation			
1. Number of average water quality parameters that exceed EPA water quality standards for irrigation water use.	2**	2**	0*
Cultural Resources			
1. Total length of distribution system route that will be disturbed by construction (linear feet)	42,800	55,000**	0*
2. Total length of undisturbed ground surface that will be disturbed by construction (linear feet)	8,580	16,580**	0*
3. Number of potentially-eligible cultural resources sites likely to be effected by construction activities.	unknown**	unknown**	0*
Socioeconomic Factors			
1. Cost of additional rate increase to fund this specific project ($/month/household)	$0.32	$0.32	$0.32
Noise and Vibration			
1. Length of pipeline to be installed in streets within 500 feet of residences (linear feet).	7,500**	2,750	0*
Human Health and Safety			
1. The number of recycled water quality parameters that exceed secondary drinking water quality standards.	2**	2**	0*
Indian Trust Assets			
1. Documented effects on Indian Trust Assets in project area.	0	0	0
Air Quality			
1. Total length of unpaved route that will be disturbed by construction (linear feet).	23,500	38,500**	0*
Total Least Change (number of designations)	**2**	**2**	**18**
Total Most Change (number of designations)	**14**	**15**	**2**
Relative Rank (1 = preferred) [/b]	**2**	**3**	**1**

[a/]

* alternative responsible for **least change** for the evaluation criterion
** alternative responsible for **most change** for the evaluation criterion

[b/] ranking based on environmental evaluation only; see text

Features and characteristics of the proposed action and its alternatives that are presented in this EA are based on detailed information in the *Industrial Recycling Project Feasibility Study* (CH2M Hill, 1999).

Major characteristics of Alternatives A and B, called the action alternatives, are summarized in Table 2.2-1. Figure 1 shows potential sources and users of reclaimed water. The No Action alternative is not included either in the table or on the figure because, without the federal action, none of the facilities would be constructed.

The definition and screening of potential alternatives to the proposed project were based on adherence to the following non-monetary engineering, operating, and construction criteria (CH2M Hill, 1999):

- Ability to meet the goals of the AWRMS;
- Availability of potential customers and the ability to provide water to meet these demands;
- Minimization and control of public disruption during construction;
- Potential for staged construction due to funding restrictions or other factors;
- Redundancy and reliability considerations;
- Flexibility for expansion;
- Need for pavement replacement after construction;
- Construction concerns;
- Need for highway, arroyo and railroad crossings;
- Number of pump stations and reservoirs;
- Availability of existing public rights-of-way for pipeline alignments;
- Operational and maintenance requirements; and,
- Sensitivity to loss of potential users.

All criteria were considered equally in the non-monetary evaluation of potential alternatives.

The locations of the three primary system components influenced development of suitable alternatives. These components included:

- Potential reclaimed water sources (the silicon chip manufacturers);
- Potential reclaimed water users;
- Land available to the City for water storage facilities; and,
- Availability of public rights-of-way to convey the reclaimed water.

One development alternative to the proposed project (Alternative A) was defined. The arroyo alignment, Alternative B, would collect the same quantity of reclaimed, non-potable water from the same industrial sources. It also would use a similar system of collection, storage, disinfection, and distribution facilities to service the same group of open space areas and commercial users.

TABLE 2.2-1
SUMMARY OF FEATURES FOR ALTERNATIVES A AND B

Characteristics	Units	Alternative A – Proposed Project	Alternative B - Arroyo Alternative
Structural			
Total length of buried pipeline	LF [a/]	42,800	54,950
Total length of pipeline in public street ROWs	LF	26,150	21,190
Total length of pipeline in undeveloped open space	LF	14,000	30,900
Total length of asphalt pavement removal/replacement	LF	15,090	10,080
Total area disturbed for ROWs	Acres	15.7	20.2
Total area disturbed for ROWs through undeveloped open space	Acres	5.1	11.3
Total of intersection crossings (constructed or bored)	Number	6	5
Total length of bored crossings.	LF	1,650	2,350
Water equalization reservoirs	Number	1	1
Water equalization reservoir dimensions	Feet	16 feet high, 105-foot diameter	16 feet high, 105-foot diameter
Water equalization reservoir capacity	MG	1.0	1.0
Area required for equalization reservoir construction	Acres	0.70	0.70
Location of equalization reservoir	--	Jefferson Street	Jefferson Street
Water storage reservoirs	Number	1	1
Water storage reservoir dimensions	Feet	32 feet high, 115-foot diameter	32 feet high, 115-foot diameter
Water storage reservoir capacity	MG	2.5	2.5
Area required for storage reservoir construction	Acres	0.90	0.90
Location of storage reservoir	--	Coronado Reservoir	Coronado Reservoir
Pump stations required	Number	1	1
Pump station capacity	mgd	9.61	9.61
Area required for pump station construction	Acres	0.20	0.20
Pump station location	--	At equalization reservoir site	At equalization reservoir site
Operational			
Total park/open space sites to potentially be irrigated	Number	12	12
Total area to be potentially irrigated	Acres	356	356
Total industries potentially receiving water	Number	4	4

TABLE 2.2-1 (Continued)
SUMMARY OF FEATURES FOR ALTERNATIVES A AND B

Characteristics	Units	Alternative A – Proposed Project	Alternative B - Arroyo Alternative
Operational (continued)			
Average annual non-potable water demand for designated turf irrigation users	Ac-ft	1,052	1,052
Average annual non-potable water demand for designated industry users	Ac-ft	459	459
Total average annual non-potable water volume available	Ac-ft	1,132	1,132
Total average annual non-potable water volume currently returned to the Rio Grande from industries	Ac-ft	964	964
Future total average annual non-potable project water volume returned to the Rio Grande	Ac-ft	236	236
Total average net annual volume of ground water that will not be withdrawn with project implementation	Ac-ft	448	448
Total construction cost	Dollars	4,963,290	5,669,620
Average annual operation and maintenance cost	Dollars	140,330	152,220
Construction duration	Months	6	6
Power requirements for annual system operations	kWh	Unknown	Unknown
Operational life	Years	50	50

a/ Acronyms and abbreviations

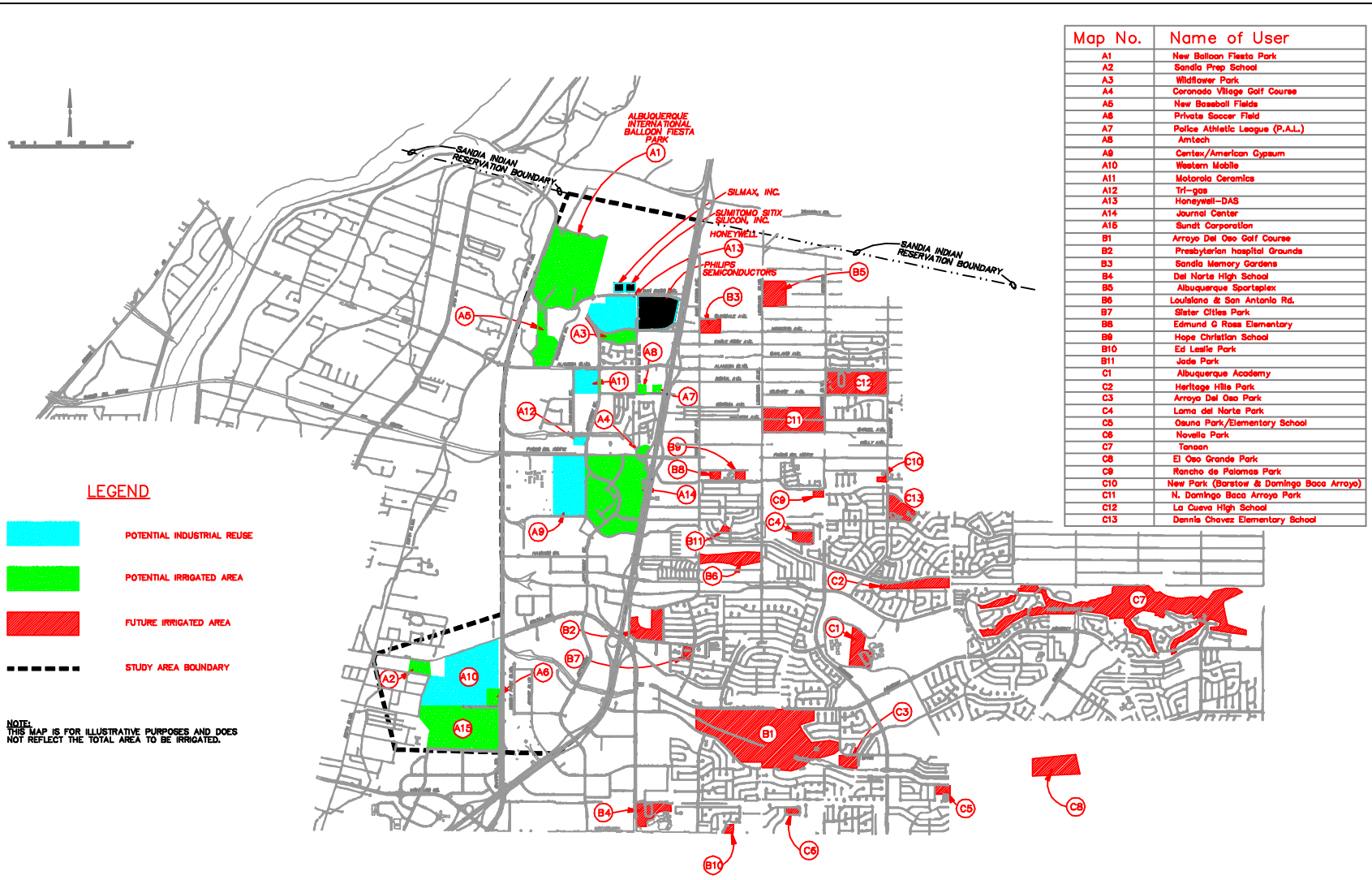
Ac-ft	acre-feet	MG	million gallons
kWh	kilowatt hours	mgd	million gallons per day
LF	linear feet	ROW	right-of-way

The primary difference is that, as shown in Table 2.2-1, Alternative B would route a greater proportion of the total pipeline through undeveloped open space rather than through residential and business areas. Most of the open space is associated with arroyos in the service area.

The third alternative is the No Action alternative. Under this alternative the City would not build the proposed project. As a result, ground water withdrawals would not be reduced.

2.3 ALTERNATIVES SCREENED FROM FURTHER CONSIDERATION

The primary objective of the proposed project is the development of an alternative non-potable water system that will allow the reuse of suitable quality industrial wastewater from the manufacture of silicon chips and other potential sources. The initial screening of suitability and feasibility of using this wastewater was evaluated during the AWRMS development process (CH2M Hill, 1997d).



Map No.	Name of User
A1	New Balloon Fiesta Park
A2	Sandia Prep School
A3	Wildflower Park
A4	Coronado Village Golf Course
A5	New Baseball Fields
A6	Private Soccer Field
A7	Police Athletic League (P.A.L.)
A8	Amtech
A9	Centex/American Gypsum
A10	Western Mobile
A11	Motorola Ceramics
A12	Tri-gas
A13	Honeywell-DAS
A14	Journal Center
A15	Sundt Corporation
B1	Arroyo Del Oso Golf Course
B2	Presbyterian hospital Grounds
B3	Sandia Memory Gardens
B4	Del Norte High School
B5	Albuquerque Sportsplex
B6	Louisiana & San Antonio Rd.
B7	Sister Cities Park
B8	Edmund G Ross Elementary
B9	Hope Christian School
B10	Ed Leslie Park
B11	Jade Park
C1	Albuquerque Academy
C2	Heritage Hills Park
C3	Arroyo Del Oso Park
C4	Loma del Norte Park
C5	Osuna Park/Elementary School
C6	Novella Park
C7	Tanoan
C8	El Oso Grande Park
C9	Rancho de Palomas Park
C10	New Park (Barstow & Domingo Baca Arroyo)
C11	N. Domingo Baca Arroyo Park
C12	La Cueva High School
C13	Dennis Chavez Elementary School

FIGURE 1
POTENTIAL NON-POTABLE WATER USERS
NORTH I-25 CORRIDOR NON-POTABLE WATER SYSTEM

CH2MHILL

As described in the AWRMS documents (CH2M Hill, 1997d), numerous alternatives were considered and screened for supply, cost, and environmental considerations. Because of the adequacy of these analyses, preparation of this EA did not repeat that screening of alternatives. Instead, alternatives screening was limited to determining the optimal pipeline routes for conveying the water from the supply sources to the user areas. Only one alternative configuration, Alternative B, the arroyo alignment, satisfied the routing operational and cost criteria.

2.4 DESCRIPTION OF ALTERNATIVES

Either of the action alternatives would be the first reclamation and reuse project for industrial water in the North Interstate 25 (I-25) area. The reclaimed water would be used for turf irrigation and industrial applications. The proposed project is anticipated to produce 1,132 ac-ft/yr. of reclaimed water.

Depending on the availability and timing of construction funds, the project may be constructed in two stages. These are designated Phases A and B in the project feasibility report (CH2M Hill, 1999). The following descriptions do not distinguish between these phases.

For both action alternatives, three sources would provide reclaimable wastewater for the proposed project. They include Philips Semiconductors, Sumitomo Sitix Silicon, and Silmax. Together, it is estimated that these industries could provide a total average of 1,132 ac-ft/yr. of semiconductor chip processing wash water for reuse. These annual volumes are based on average daily flows of 1.01 mgd. An inventory of the water that would be supplied by each of the three industries is provided in Table 3-1 of the feasibility report (CH2M Hill, 1999). Reclaimed wastewater would be treated by the generators to meet City-stipulated performance standards, including appropriate industrial pre-treatment and irrigation standards.

Seasonal fluctuations in water demand for turf irrigation may result in some of the reclaimed water allocated for turf irrigation not being used. Industrial demand for the reclaimed water is expected to be fairly constant. During periods of low reclaimed water demand, excess process wastewater from the semiconductor companies would be sent to the City wastewater treatment plant for processing and discharge to the river. The process wastewater from these facilities currently is managed in this manner. Therefore, all of the connections and treatment capacities are already in place.

For both action alternatives, reclaimed water would be collected at a 1-million-gallon steel equalization reservoir that would be sited on the Honeywell property near the industrial facilities (Figure 1). A 9.61-mgd pump station next to the equalization reservoir would pump the reclaimed water to the storage reservoir east of I-25. The pump station would be housed in a 2,200-square-foot, roofed structure. The pump building and the equalization reservoir would occupy about one acre of land. The building would be architecturally compatible with the surrounding area. At the equalization reservoir, disinfection would occur by adding chlorine to the non-potable water to maintain a 1-milligram per liter (mg/L) residual and prevent the growth of bacteria in the distribution system.

The second storage reservoir for both action alternatives would be located on City property next to the Coronado Reservoir between Paseo del Norte and Palomas Avenue. This location presently contains a 5-million-gallon drinking water storage reservoir, which is not part of the

proposed project. The 2.5-million gallon reclaimed water storage reservoir would be 32 feet high and 115 feet in diameter. Construction of the new reservoir would disturb approximately one acre.

Water would be released from the reclaimed water storage reservoir to meet average peak demands. The high water elevation of the reservoir would establish the hydraulic gradient required to move the water by gravity to the areas of use.

The distribution piping for both alternatives would range in diameter from 8 inches to 24 inches. The pipelines would be constructed of such materials as ductile iron, polyvinyl chloride (PVC), or concrete cylinder pipe. The pipelines would be differentiated from potable water lines by being purple in color, in conformance with the industry standard.

For both action alternatives, the location and alignment of the pipeline would be identical for all areas south of Domingo Baca Arroyo. The pipeline would be laid in a trench approximately 5 feet deep. The trench would disturb an area approximately 4 feet wide. The pipeline within the City streets would be placed within existing utility rights-of-way and would only disturb the paved section of the street. In unpaved areas the total width effected by construction activities is estimated to be 25 feet. The pipeline would be bored under many of the major road and arroyo crossings to avoid traffic disruption or the demolition and replacement of arroyo linings. Major road and arroyo crossings include Alameda, I-25, Paseo Del Norte, and Domingo Baca Arroyo north of Tri-Gas on Jefferson Street.

The operational life of the project for both action alternatives is assumed to be 50 years. Project facilities would be designed to accommodate potential future expansion of the non-potable water system to meet the projected demands of additional users (CH2M Hill, 1998a and 1999).

For both action alternatives, approximately 60 percent of the reclaimed water would be used for turf irrigation at up to 12 candidate sites. These sites are shown on Figure 1. The irrigated acreage and average annual water use of the sites are summarized in Table 2.4-1. The total area of these sites is 356 acres, and ranges from 270 acres at the Balloon Fiesta Park to 2 acres at the AMTECH site. Details on irrigated acreage's average water use, maximum water use, and peak water use by individual site are provided in Table 2.2-1 of the project feasibility report (CH2M Hill, 1999). Only one area will be irrigated that is not currently irrigated. That area is the Balloon Fiesta Park, most of which is an abandoned gravel pit.

Potential commercial or industrial users would comprise about 40 percent of the total use for both action alternatives. The five potential commercial users and the amounts they potentially would use on an average annual basis are provided in Table 2.4-1. Use would range from about 168 ac-ft/yr. at the Centex/American Gypsum facility to 45 ac-ft/yr. at the Western Mobile plant. The locations of the operations are shown on Figure 1.

The construction period duration for each development alternative would be approximately 6 months. Because the pipelines could be laid at a rate of 400 to 500 feet per day, construction activities would be brief near any location. Boring of the pipeline under I-25 would take about 1 week.

TABLE 2.4-1
POTENTIAL NON-POTABLE TURF IRRIGATION AND INDUSTRIAL WATER USERS [a/]

Identified Users for Non-potable Water	Irrigated Acres	Average Water Use (ac-ft/yr.) [b/]
Turf irrigation		
Balloon Fiesta Park	270	899.9
Sandia Prep School	16	53.8
Journal Center	15	50.4
Wildflower Park	12	40.3
Coronado Village	10	33.6
New baseball fields	9	30.3
Sundt Corporation	6	20.2
Private Soccer Field	5	16.8
Police athletic fields	4	14.6
Honeywell-DAS	4	1.1
Motorola Ceramics	3	10.1
AMTECH	2	6.7
Subtotal	356	1,177.7
Industrial users	--	
Centex/American Gypsum	--	168.1
Motorola Ceramics	--	100.8
Tri Gas	--	78.4
Honeywell –DAS	--	67.2
Western Mobile	--	44.8
Subtotal	--	459.4
Total annual potential demand		**1637.1**

a/ Source: CH2M Hill, 1999

b/ Acronyms and abbreviations
ac-ft/yr. acre-feet per year

2.4.1 Alternative A, the Proposed Project

Alternative A was selected as the preferred alternative because of its lower cost for construction and maintenance compared to Alternative B, and its high score in the non-monetary criteria evaluation (CH2M Hill, 1999). The key structural features of Alternative A are summarized in Table 2.2-1. The locations and arrangements of project structural features are displayed on Figure 2.

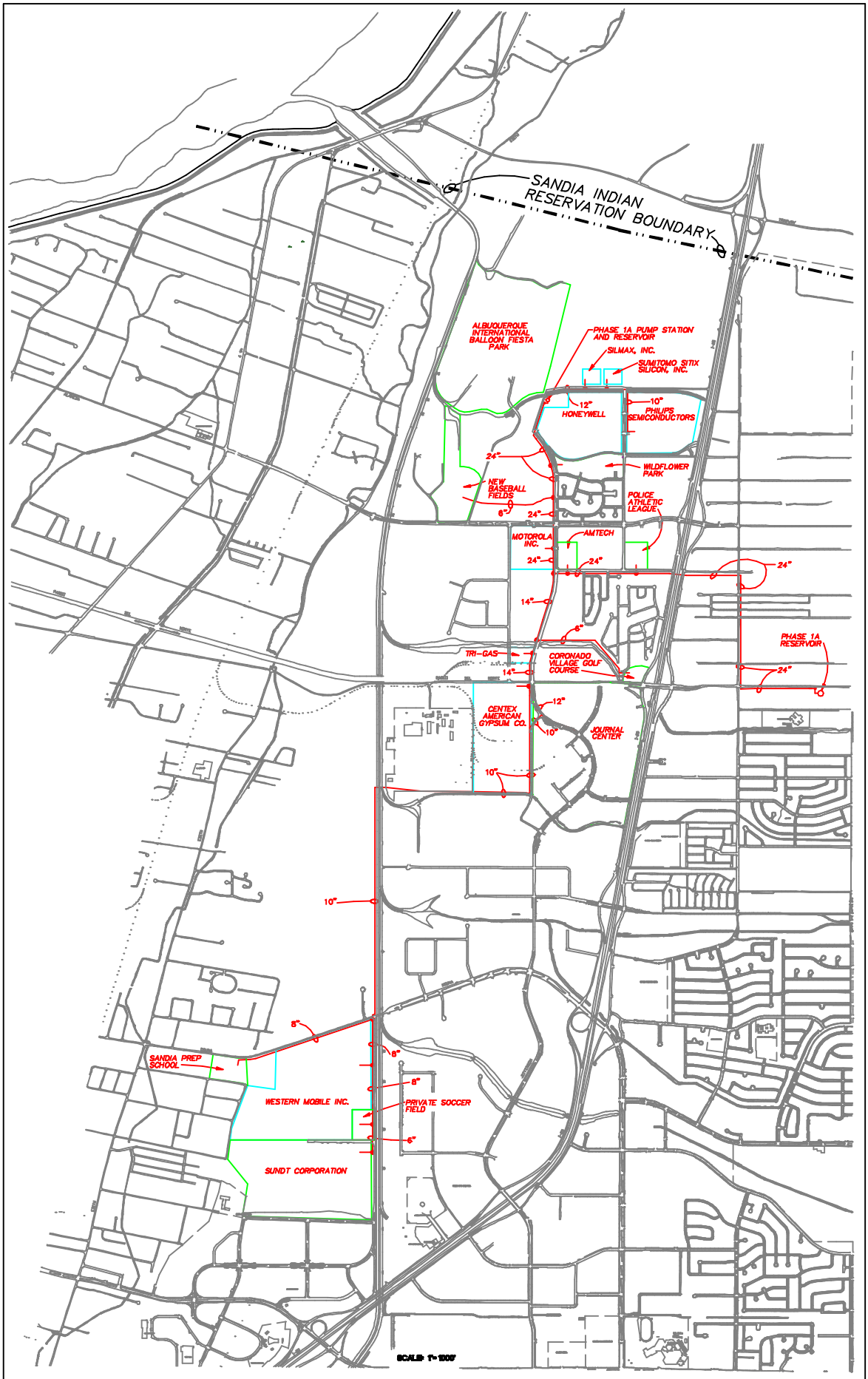


FIGURE 2 – REUSE PIPE ALIGNMENT ALTERNATIVE A

CH2MHILL

Alignments in City streets were preferred for this alternative because of the shorter pipeline length required compared to Alternative B. This alternative was developed to minimize the length of pipeline required to connect the pump station to the 2.5-million-gallon storage reservoir. This alternative also was designed to place the pipeline primarily within existing street rights-of-way.

The entire Alternative A pipeline alignment would be in public rights-of-way. The pipeline would be bored under I-25 along the alignment of Wilshire Avenue. Table 2.4-2 summarizes linear feet of pipeline, including length in road rights-of-way, along arroyos, in road crossings, and as stubouts that would provide connections to the existing water supply systems of the users. The table also includes linear feet of asphalt that would need to be removed to construct Alternative A.

2.4.2 Alternative B, the Arroyo Alignment

Alternative B differs from Alternative A by locating the main transmission pipeline away from public streets and keeping more of the pipeline corridor near open spaces associated with existing arroyos, drainage easements, and street rights-of-way. The key structural features of Alternative B are summarized in Table 2.2-1. The locations and arrangements of project structural features are displayed on Figure 3.

Avoiding public streets would reduce traffic control requirements and costs associated with pavement replacement. However, as shown in Table 2.2-1, these savings would be more than offset by the costs for an additional 12,150 feet of pipeline that would be required for this alternative. This alternative would locate the non-potable water distribution pipeline along the Albuquerque Metropolitan Arroyo Flood Control Authority (AMAFCA) North Diversion Channel. Table 2.4-3 details the street effects. Alternative B would involve boring under I-25 along the alignment of the Domingo Baca Arroyo.

2.5 FEATURES COMMON TO ALTERNATIVES A AND B

Seasonal fluctuations in water demand for turf irrigation will result in some periods when not enough reclaimed water will be available to meet the demands of all of the irrigation users. Peak summer seasonal demands for turf irrigation water will require the continued use of some ground water, in addition to the available reclaimed water. Users of the recycled water will retain connections to the City's existing water system or to their own deep wells to insure that water is available for their uses if the recycled water system cannot provide the water required, either due to system failure or recycled water availability. However, this demand will be at reduced amounts because of the off-setting effects of the supply of reclaimed water from the proposed project.

The City would monitor ground water quality in the project area to ensure that the project meets New Mexico Environment Department (NMED) and Ground Water Protection Plan and Action Policy (GPPAP) requirements.

Environmental protection measures to be incorporated into the design and construction of the alternatives are discussed for each resource category in the Affected Environment and Environmental Consequences section, and all are summarized in the Environmental Commitments section.

TABLE 2.4-2
LINEAR FEET OF PIPELINE AND ASPHALT REMOVAL FOR ALTERNATIVE A [a/]

Location	In Road ROW [b/]	Along Arroyo	Road Crossing	Stubouts to Users	Total Linear Feet	Asphalt Removal
San Mateo	950		100	120	1,170	
San Diego	2,220			350	2,570	
Reservoir at San Diego				310	310	
North Jefferson	6,390		530	420	7,340	6,390
Wilshire	3,840		300	180	4,320	2,360
San Pedro	2,720		60		2,780	2,720
Paseo del Norte	1,680		150	140	1,970	1,680
Journal Center	1,000			50	1,050	
Domingo Baca Arroyo		2,410	60	10	2,480	
Reservoir at Coronado Station				380	380	
South Jefferson	440				440	
Tiburon	1,950				1,950	1,940
North Pino Arroyo		3,380	50		3,430	
AMAFCA Channel		8,210	250	580	9,040	
Osuna	3,310		150	110	3,570	
Total	**24,500**	**14,000**	**1,650**	**2,650**	**42,800**	**15,090**

a/ Source: CH2M Hill, 1999

b/ ROW - right-of-way

No specific measures were incorporated into either action alternative to address potential effects on Indian Trust Assets, as no potential effects were identified.

2.6 NO ACTION ALTERNATIVE

Under the No Action alternative, the proposed project would not be constructed, and none of the identified environmental effects would occur. Further, this proposed first step in implementing the objectives of the AWRMS (implementing a conjunctive use management approach as the basis for reducing demand on the ground water aquifer and providing a sustainable supply, and preserving the ground water aquifer as a primary drought reserve) would not take place.

The City's potable water is currently obtained from deep ground water sources. The No Action alternative would require the continued use of deep ground water to meet current and future water demands. This action would conflict with the AWRMS and it would continue the current drawdown and depletion of the deep aquifer. The No Action alternative does not meet the project purpose and need.

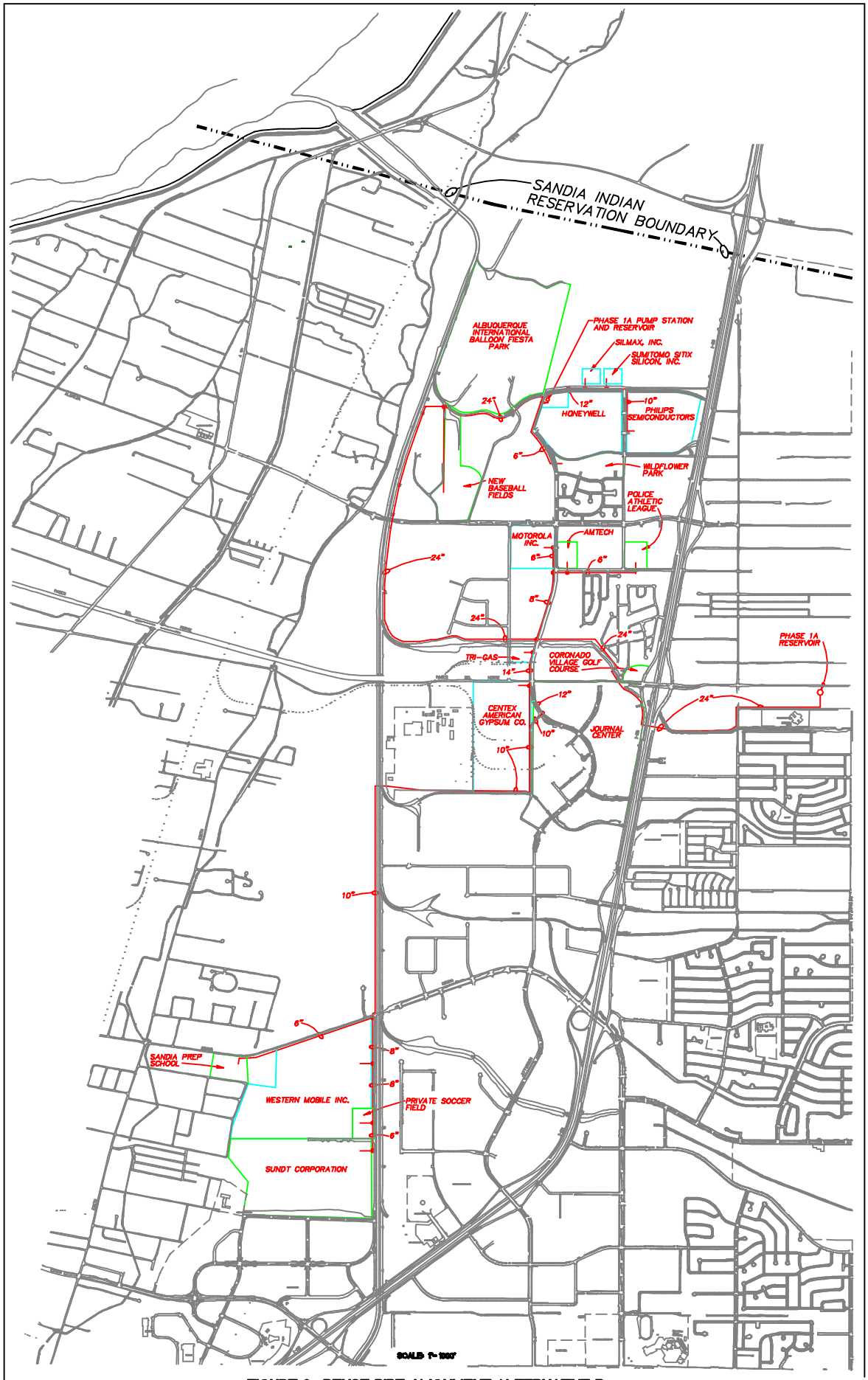


FIGURE 3- REUSE PIPE ALIGNMENT ALTERNATIVE B

CH2MHILL

TABLE 2.4-3
LINEAR FEET OF PIPELINE AND ASPHALT REMOVAL FOR ALTERNATIVE B [a/]

Location	In Road ROW [b/]	Along Arroyo	Road Crossing	Stubouts to Users	Total Linear Feet	Asphalt Removal
San Mateo	950		100	120	1,170	
San Diego	2,220			650	2,870	
Reservoir at San Diego				390	390	
La Cueva Arroyo		2,600	100		2,700	
AMAFCA Channel		5,200	300		5,500	
New Ball Park		2,000			2,000	
North Jefferson	4,850		500	430	5,780	4,850
Wilshire	1,650			100	1,750	1,650
San Pedro	500		60		560	
Palomas	1,970		60		2,030	1,640
Journal Center	1,000			60	1,060	
Domingo Baca Arroyo		9,510	780	10	10,300	
Reservoir at Coronado Station				410	410	
South Jefferson	440				440	
Tiburon	1,950				1,950	1,940
North Pino Arroyo		3,380	50		3,430	
AMAFCA Channel		8,210	250	580	9,040	
Osuna	3,310		150	110	3,570	
Total	**18,840**	**30,900**	**2,350**	**2,860**	**54,950**	**10,080**

a/ Source: CH2M Hill, 1999

b/ ROW - right-of-way

SECTION 3

AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This section describes the affected environment and potential environmental consequences of implementing Alternative A, the proposed project; Alternative B, the arroyo alignment; and the No Action alternative. The project issues in this section reflect the specific environmental concerns that were identified during scoping meetings with agencies and the public. Environmental commitments that would reduce or eliminate identified environmental effects of the alternatives are identified.

3.1 EVALUATION OF ENVIRONMENTAL RESOURCES

The environmental resources of the project area were divided into two groups:

- Resources that require detailed evaluation. These were identified in scoping meetings with the City, the lead federal agency (Reclamation), involved federal agencies, and the public.
- Resources that were not evaluated in detail because of the lack of identified project effects or public and regulatory concerns. These resources were not identified with specific concerns during the scoping process

Issues identified for each resource area during the scoping process are addressed by the environmental effect analysis. A summary of identified resource issues is presented in Table 3.1-1.

TABLE 3.1-1
RESOURCE AREAS AND ISSUES ADDRESSED IN THE EA

Resource Area	Specific Issue Addressed
Water	Effects of project operation on ground water quality and return flows to the Rio Grande
Aesthetics/visual resources	Intrusion of water storage reservoirs on nearby residents' views
Traffic and circulation	Effects of construction activities on traffic
Biological resources	Effects on threatened and endangered species, wetlands, and riparian areas
Soils and vegetation	Effect of potential buildup of salts in soil and its ability to support vegetation
Cultural resources	Effects of construction activities on archaeological and historical resources
Socioeconomic factors	Effects of an increase in water rates to City customers
Noise and vibration	Effects of construction activities on nearby residents
Human health and safety	Potential for cross-connections with the potable water system
Indian Trust Assets	Effects on Indian Trust Assets
Air Quality	Generation of emissions and dust by construction activities
Environmental Justice	Effects on minority or low-income populations

Specific issues or concerns were not identified for the following resources during the scoping process. Therefore, these resources were determined not to be adversely affected by the proposed project or its alternative and were not analyzed in detail.

- Energy.
- Geology.
- Hazardous and toxic waste.
- Land use.
- Recreation.

3.2 ENVIRONMENTAL EFFECTS ANALYSIS APPROACH

The environmental effects analysis was performed by evaluating the location and scope of the proposed project activities and structural facilities in relation to the existing environment of the project area. The interaction of project and environment was examined for each resource area for which issues were identified during scoping. Resource-specific criteria were developed and applied to the interaction of the proposed project actions and existing resource conditions to determine if an effect would occur and to estimate its importance. Quantitative changes in the resource criteria were estimated and are presented in two portions of this EA. Criteria for which resource changes were anticipated are presented in tabular fashion with the applicable resource discussion. Resource evaluation criteria for which there were no anticipated direct, indirect, or cumulative effects are listed in Appendix D of this EA. These criteria are organized by resource category and are included to document that the issues embodied by the criteria were evaluated and were determined to be unaffected by the proposed action and its alternatives.

The project evaluation incorporated design features that are intended to minimize or eliminate potential environmental effects. These features are typically included in projects to address regulatory requirements for environmental protection. Examples include best management practices (BMPs) that routinely are associated with construction activities or resource management. The effects evaluation was performed assuming that these design features would be implemented or otherwise in place.

All resource effects analyses were conducted in the following steps:

- Define the resource environment in the project area.
- For each issue identified during scoping, define the criteria with which the resource effects will be evaluated.
- Evaluate the proposed action and its alternatives, including environmental design features, and determine the extent, magnitude, and type of resource changes resulting from potential direct, indirect, and cumulative effects.
- Identify, compile and separately evaluate the potential consequences of direct, indirect, and cumulative changes of each resource that is altered or affected.
- Identify effects being of a magnitude great enough to cause adverse or undesirable resource changes of concern, based on stated evaluation criteria.
- Recommend mitigation measures for effects identified as being of a magnitude great enough to cause adverse or undesirable resource changes of concern.

- Evaluate the anticipated effectiveness of the recommended mitigation measures.
- Determine whether the net effect of incorporating the mitigation measures and the design features effectively mitigates potential adverse effects, or whether an effect of substantial concern remains from the proposed action or its alternatives.
- Determine whether the proposed action qualifies for a finding of no adverse impact (FONSI) determination or whether it requires further evaluation through the environmental impact statement (EIS) process.

3.3 ENVIRONMENTAL COMMITMENTS FOR THE PROJECT

Reclamation's guidance for implementing NEPA (Bureau of Reclamation, 1990) requires that the EA identify environmental commitments that Reclamation and/or the project sponsors (the City) are committed to carry out should the project be implemented. Identifying environmental commitments discloses the intentions and commitment of the City to minimize effects on the environmental resources.

This EA identifies environmental commitments as both environmental design features and mitigation measures. Environmental design features are elements of the proposed project design such as BMPs that are intended to minimize or avoid potential environmental effects. Mitigation measures are steps, activities, or changes to the project that are implemented to offset an effect that would otherwise result in an undesirable adverse change of the resource.

For each resource in this section, environmental design features and mitigation measures are addressed separately. All project environmental commitments are summarized in Section 4. Unless otherwise noted, it was assumed that the same environmental commitments would be applied to both action alternatives.

3.4 AREA OF EVALUATION

The area of environmental effects evaluation was the same for Alternative A, the proposed project; Alternative B, the arroyo alignment; and the No Action alternative. The two geographic areas of concern included the project area and the evaluation area.

The boundaries for the project area included the following.

- The west boundary is the City limit, which generally parallels Edith Boulevard.
- The north boundary is the northern City limit, which is just south of Tramway Boulevard.
- The east and south boundaries of the project area are bounded by Louisiana Boulevard from the northern city limits to the point where it crosses Domingo Baca Arroyo, then west along Domingo Baca Arroyo to I-25, then south along I-25 to Montaño Road, then west to the city limit which forms the western boundary.

The evaluation area includes the project area, plus adjacent areas in which resources potentially could be affected or where cumulative effects potentially could occur. The perimeter of the evaluation area extends 0.5 miles outside of the east, south, and west sides of the project area. The Bernalillo County line is the boundary of the evaluation area on the north side. The evaluation area covers parts of the northeast and northwest quadrants of the City, plus Los

Ranchos De Albuquerque along the west side and the Sandia Indian Reservation on the north side.

An exception to the evaluation area included the Rio Grande channel and its flows, because of the potential alteration of the existing flow regime caused by smaller return flows from the wastewater treatment plant. This alteration of flows could result in decreased flows downstream of the City's Southside Water Reclamation Plant discharge. The expanded project area considered included the Rio Grande channel from the wastewater treatment plant discharge to the Isleta Diversion Dam, a distance of approximately 8 miles. The evaluation also considered the potential habitat in and adjacent to the river channel. The resource area analyses affected by this expanded area were 1) Water and 2) Biological Resources.

Another exception to this evaluation area was the area considered for cultural resource effects. The New Mexico State Historic Preservation Office (SHPO) guidance requires an evaluation area of up to 1 mile from the project boundary. Therefore, a perimeter distance of 1 mile from the project area was used for the cultural resources evaluation area.

3.5 WATER

The project-related water quality and quantity environmental issues identified during scoping activities are listed in Table 3.1-1.

3.5.1 Affected Environment

Ground Water

The proposed action would supply reclaimed water for industrial and turf irrigation uses in the project area. While industrial use rates of the reclaimed water are expected to be fairly steady over a calendar year, the amount of water applied for turf irrigation would vary by month, depending on the water demand of the turf. Use for irrigation would be lowest in the winter and highest in the summer (CH2M Hill, 1999). The total annual future supply of water available from the three identified industrial sources for industrial and irrigation purposes in the proposed project would be approximately 1,132 ac-ft/yr. (CH2M Hill, 1999).

Water pumped from the deep aquifer is only partially recharged from the Rio Grande (U.S. Geological Survey, 1995). Studies by the USGS and others indicate approximately 50 percent aquifer recharge per volume of ground water pumped (CH2M Hill, 1998b). The other 50 percent of the pumped water results in aquifer drawdown.

Surface Water

Infiltration of river water into the aquifer following water pumping from the deep aquifer results in decreased flows in the Rio Grande. However, this river volume reduction is offset by discharges from the City's wastewater treatment plant that return approximately 50 to 60 percent of the pumped ground water to the river.

The proposed project's reclamation of some of the water pumped from the aquifer would reduce the amount of water initially pumped from the aquifer and, thereby, reduce the amount of infiltration from the river. The proposed action would also decrease the total amount of water

treated and discharged back to the river. The net effect of the proposed action on flows in the Rio Grande is thus a combination of reduced ground water pumping, reduced infiltration from the river to the aquifer, and a reduction in treatment plant return flows back to the river.

Water Quality

The State of New Mexico has developed ground water limitation standards to protect the quality of the ground water in the state from degradation resulting from the discharge of liquids or solids to the environment. These numerical regulations relate to the quality of the water in the ground, not the quality of applied or discharged water. Water that has concentrations of regulated constituents greater that those listed in the regulations can be discharged, as long as the local ground water constituent concentrations remain less than the standards.

Reclaimed industrial wastewater that is land-applied for irrigation cannot be allowed to degrade local ground water quality below the limitation values. A ground water discharge plan (GWDP) must be submitted to the NMED describing the quality of the water to be applied, BMPs to be implemented, and the quality of ground waters in the project area. NMED determines if the local ground water may be vulnerable to contamination by the proposed discharge, and may place procedural or numerical limitations on the water being applied. The City's *North I-25 Reuse Corridor Groundwater Discharge Permit Application* (CH2M Hill, 1998c) to the NMED includes such a plan in support of an application for a ground water discharge permit. A permit for the project was issued by NMED in April 1999.

The City adopted the Ground Water Protection Policy and Action Plan (GPPAP) to protect the ground water resources within the City service area and Bernalillo County. The goal of the plan is to maintain the ground water quality at or above the drinking water standards. The GPPAP also mandates that no discharge to ground water be allowed within 200 feet of a municipal supply well.

The GPPAP identified action levels at which appropriate measures, such as increased frequency of ground water quality monitoring, are taken. The action levels are reached when ground water monitoring shows concentrations of constituents of concern are either:

- Present at 50 percent of the primary drinking water standards; or
- Present at 100 percent of the secondary drinking water standards.

If either of these action levels were reached, the City would take the steps necessary to prevent ground water constituent concentrations from exceeding 50 percent of the primary standards and 100 percent of the secondary standards.

3.5.2 Environmental Consequences

The following situations would be deemed a significant effect to water. Potential human health implications of water quality changes are addressed in Section 3.13.

- The reuse of the industrial effluent as reclaimed water would significantly reduce the flow in the Rio Grande by reducing the volume of the City's wastewater treatment plant discharge.
- The reuse of the industrial effluent as reclaimed water would significantly reduce the water quality of the wastewater at the City's discharge to the Rio Grande.

- The use of the reclaimed water turf irrigation would degrade existing ground water quality.

The anticipated effects of the proposed project and its alternatives are summarized in Table 3.5-1. As the summary comparison indicates, there are no substantial differences in anticipated effects to water between the two development alternatives.

Ground Water

The proposed reclaimed water project would reduce the water demand on the deep aquifer for compatible industrial uses and turf irrigation, a benefit of the proposed action. The annual average reduction would be approximately 448 acre-feet per year (CH2M Hill, 1998b), totaling as much as 22,400 acre-feet over the planned operational life of the project facilities. This would be a beneficial effect of the proposed project.

Surface Water

Both of the development alternatives would result in water being applied for the same uses and at the same locations. The use of reclaimed water for irrigation, instead of discharging the effluent to the City's wastewater treatment plant, would result in less water being treated and discharged to the Rio Grande compared to current practices. Table 3.5-2 details the effect on river flow volumes and ground water resources of implementing the proposed action. Up to a net volume of 448 ac-ft/yr. of ground water would not be pumped. The net reduction in flow in the Rio Grande is approximately 0.2 percent during the lowest-flow months of the year, with the annual average reduction being 0.05 percent (Table 3.5-2; Figure 4).

While the overall reclaimed water use for turf irrigation and industrial purposes would vary from month to month, the overall effect on river flows would be small. The gage that measures the flow of the Rio Grande is located at the Central Avenue Bridge. During the months of lowest average monthly river flows (August through November), this effect would be a maximum of 0.2 percent of the flow in the river (Table 3.5-2). This level of flow reduction would be well within the long-term variability of river flows during these months, and would not be considered adverse.

This analysis has addressed the incremental effects of the proposed water reclamation project. As the AWRMS is implemented, the City is planning to develop additional water reclamation projects, which, in combination with the proposed project, would supply approximately 12,800 ac-ft/yr. of reclaimed water for non-potable uses such as industrial processes and turf irrigation. NEPA compliance requirements for these two water reclamation projects will be addressed in a single environmental assessment.

Water Quality

As shown in Table 3.13-2, the industrial water that would be reclaimed for this project is of very high quality and meets all primary and all but two secondary drinking water standards. This is higher-quality water than all other wastewater treatment plant influent, and may slightly reduce the overall concentrations of some parameters in the total influent stream.

TABLE 3.5-1
SUMMARY OF ANTICIPATED EFFECTS TO WATER

Evaluation Criterion	Alternative A	Alternative B	No Action
1. Total quantity of wastewater requiring treatment at the City wastewater treatment facility (ac-ft/yr.).	0	0	1,132
2. Net reduction of flow in the Rio Grande during low flow periods as a result of using reclaimed wastewater for turf irrigation and other uses (percent).	0.19	0.19	0
3. Reduction in annual average flow from the City's wastewater treatment plant discharged to the Rio Grande (percent).	1.8	1.8	0
4. Total net annual quantity of ground water removed from ground water aquifer for non-potable use (acre-feet per year).	0	0	448
5. Number of water quality parameters exceeding state ground water concentration standards.	1	1	0

On a daily basis, the City wastewater treatment plant receives and treats approximately 57 mgd, or 64,200 ac-ft/yr. of wastewater and discharges the effluent to the Rio Grande. The reduction of influent flow to the treatment plant from the proposed action (a maximum of approximately 1 mgd, or 1,132 ac-ft/yr.) represents an average annual reduction of only 1.8 percent of the flow through the plant. The loss of this small quantity of water would not adversely affect the quality of the water discharged to the river.

The wastewater treatment plant outfall is located one-quarter mile south of the Rio Bravo Boulevard Bridge. Note that this outfall is located downstream from the Rio Grande at Albuquerque flow gage that measures the volume of water that flows past the gage per unit time, so that flows recorded by the gage are augmented by the flow from the wastewater treatment plant.

With regard to ground water degradation, fluoride is the only constituent that could affect the use of the water for irrigation of large turf areas. The estimated fluoride levels would be about 3.6 mg/L, greater than the NMED ground water concentration standard of 1.6 mg/L (Table 3.5-3). Soils in the service area are somewhat alkaline in nature, which would result in fluoride inactivation through adsorption and precipitation as insoluble soil salts such as calcium fluoride. Testing of soils at Balloon Fiesta Park indicates that fluoride is inactivated by the local soils at a rate of 2 milligrams (mg) of fluoride for every kilogram (kg) of soil (CH2M Hill, 1998c). Based on a ground water depth of 138 feet, it may require almost 200 years for the applied fluoride to exhaust the fluoride inactivation capacity of the unsaturated zone (CH2M Hill, 1998c). If the project continued beyond that period, the NMED and GPPAP groundwater protection requirements would still be in effect. If in the future fluoride became a ground water quality problem, the specifications of these programs would require the City to take action to safeguard ground water quality.

TABLE 3.5-2
EFFECT ON RIO GRANDE FLOWS FROM IMPLEMENTATION OF THE PROPOSED RECLAIMED WATER PROJECT

Month	Total Average Project Non-Potable Demand [a/] (cfs) [d/]	Total Average Project Non-Potable Demand [a/] (AFM) [d/]	Net Reduction in River Flow [b/] (cfs)	Net Reduction in River Flow [b/] (ac-ft/mo.)	Monthly Average Flows – Rio Grande at Albuquerque (cfs) [c/]	Reduction in Monthly Average Flow Due to Water Not Returned (percent)
January	0.56	33.60	0.28	16.80	900	0.03
February	0.66	39.25	0.33	19.62	1,000	0.03
March	1.20	73.13	0.60	36.57	1,170	0.05
April	2.08	123.96	0.78	47.14	2,000	0.04
May	3.04	186.08	0.78	47.14	3,170	0.02
June	4.17	248.20	0.78	47.14	2,670	0.03
July	4.24	259.49	0.78	47.14	1,370	0.06
August	3.59	219.96	0.78	47.14	840	0.09
September	2.65	157.84	0.78	47.14	500	0.16
October	1.66	101.37	0.78	47.14	420	0.19
November	0.94	56.19	0.47	28.10	580	0.08
December	0.56	33.60	0.28	16.80	1,000	0.03
Annual total		**1532.67**		**447.84**		**0.05**

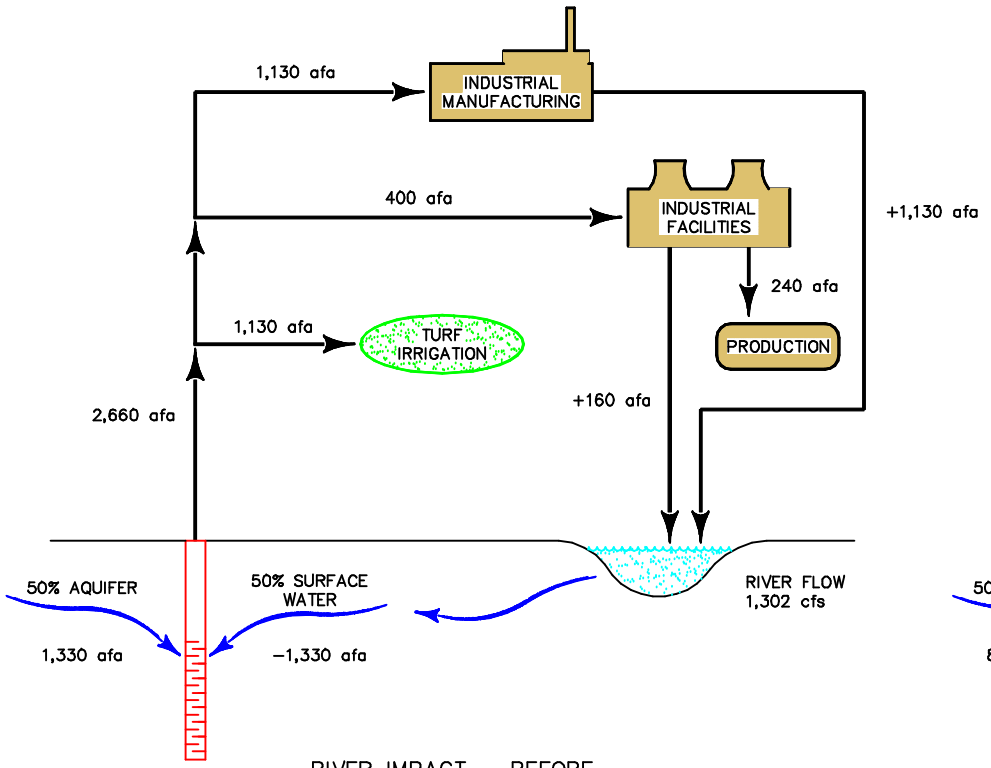
a/ Combined monthly turf irrigation and industrial use reclaimed water volume (CH2M Hill, 1998b, 1999).
b/ Net water used for reclaimed water project that is not returned to the river (CH2M Hill, 1998b).
c/ Rio Grande at Albuquerque, 1956-1995 (estimated from CH2M Hill, 1997b; Figure C-8).
d/ cfs = cubic feet per second. ac-ft/mo. = acre-feet per month.

The City's GPPAP restricts the discharge of water to land within 200 feet of municipal supply wells. The nearest supply wells to the areas to be irrigated during the project are approximately 2,500 feet away from and upgradient of the nearest irrigated area. Therefore, the project would comply with this GPPAP requirement and would not result in adverse effects to the quality of water withdrawn from municipal supply wells.

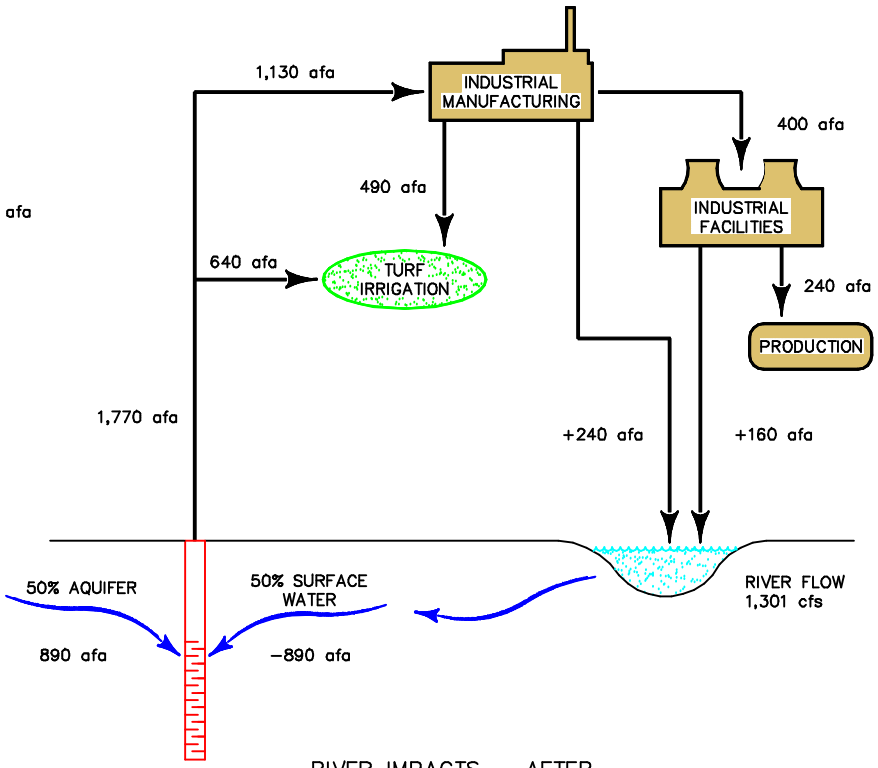
The No Action alternative would not result in any of the potential effects to water associated with the development alternatives. There would be no reduction in return flows to the Rio Grande associated with water reclamation. However, none of the identified benefits to the deep aquifer associated with the replacement of uses of deep aquifer water with reclaimed water would be achieved. The long-term effects of not implementing the WRSI program would be catastrophic ground subsidence and attendant damage to infrastructure in the City, as well as rendering the aquifer body unable to store adequate quantities of ground water to support future use. The effects of this situation on the socioeconomic structure of the community are addressed in Section 3.11.

INDUSTRIAL RECYCLING PROJECT
RIVER IMPACTS

BEFORE



AFTER



RIVER IMPACT – BEFORE

Return Flow	+1,290 afa
Industrial Pumping	−770 afa
Irrigation Pumping	−565 afa
Total Impacts	−45 afa

NET IMPACTS TO THE RIVER

Return Flow	−890 afa	−1.2 cfs
Industrial Pumping	+200 afa	+0.3 cfs
Irrigation Pumping	+245 afa	+0.3 cfs
Total Impacts	−445 afa	−0.6 cfs

RIVER IMPACTS – AFTER

Return Flow	+400 afa
Industrial Pumping	−570 afa
Irrigation Pumping	−320 afa
Total Impacts	−490 afa

CH2MHILL

TABLE 3.5-3
COMPARISON OF RECLAIMED INDUSTRIAL WATER AND NEW MEXICO GROUND WATER CONCENTRATION STANDARDS

Constituent	Estimated Blended Industrial Reclaimed Water Concentration (mg/L) [a/]	New Mexico Ground Water Concentration Standard (mg/L) [b/]
Aluminum	0.05	5.00
Arsenic	0.03	0.10
Boron	0.20	0.75
Barium	0.03	1.00
Cadmium	0.0014	0.01
Chloride	76	250.00
Cobalt	0.01	0.05
Chromium	0.02	0.05
Copper	0.03	1.00
Fluoride	3.63 [c/]	1.60
Iron	0.03	1.00
Manganese	0.02	0.20
Nickel	0.02	0.20
Nitrate	8.57	45.00
Lead	NA	0.05
Selenium	0.004	0.05
Silver	Not available	0.05
Sulfate	146	600
TDS	656	1,000
Zinc	0.02	10

a/ Source: CH2M Hill, 1998b.
b/ New Mexico, State of, 1997.
c/ Shaded constituents indicate irrigation water exceedence of ground water standard limitations.

3.5.3 Environmental Commitments

Environmental Design Features

The following project design features would minimize or eliminate potential project effects to water quality and quantity:

- The reclaimed water will meet agreed-to standards defined in a contract between the source industries and the City.
- The City will perform periodic sampling of the reclaimed water as defined in the GWDP (CH2M Hill, 1998c) to confirm that the water quality meets NMED application standards and the City's GPPAP. Changes in water application procedures or additional treatment will be made to remain compliant with applicable standards if monitoring indicated potential problems.
- State approval of the GWDP application will be acquired prior to issuing construction permits for the reclaimed water distribution system (GPPAP requirement).

- The City will ensure that the reclaimed water quality will meet the appropriate user requirements for industry, turf irrigation, and other uses (Albuquerque, City of, 1998; CH2M Hill, 1999), on an ongoing basis.
- The City will meter all use of the reclaimed water by all users.
- The City will conduct an ongoing monitoring program to assure that ground water quality in the project area is not affected by the proposed project, per NMED and GPPAP requirements. The City will use its existing regional ground water monitoring network to perform this monitoring. The monitoring program will be conducted at a frequency and at appropriate locations to allow a complete picture of existing ground water quality and the potential effects of project actions, as required by the GWDP.
- The City will create, maintain and update an accounting system that will document the proposed projects' effects on the flow regime of the Rio Grande, and will be updated to include the effects of the City's other planned water reclamation and water supply projects.

The same measures will be applied to either Alternative A or B.

There are no anticipated long-term water quality or quantity effects associated with either of the development alternatives that will require mitigation measures. If effects are noted by the monitoring program discussed above, the City will implement the provisions of the NMED and GPPAP remediation measures, as required by State and City policy.

3.6 AESTHETICS AND VISUAL RESOURCES

The project-related aesthetics and visual resources environmental issues identified during scoping activities are listed in Table 3.1-1.

3.6.1 Affected Environment

The project pump station and equalization reservoir would be constructed in the northwest corner of the project area on the Honeywell property, near the industrial supply for the reclaimed water (Figure 2). The equalization reservoir would be 16 feet high and 105 feet in diameter. The location is near the east entrance to the Balloon Fiesta Park and about 500 feet northwest of the Wildflower residential area and Wildflower Park. The reservoir would be visible from the new baseball fields at the Balloon Fiesta Park, which are approximately 1,000 feet from the reservoir site. Residents of the Wildflower area have expressed concern about the aesthetics of the reservoir, including graffiti that may be painted on the reservoir.

The reclaimed water storage reservoir would be constructed at the Coronado Reservoir, a City-owned property located on Paseo del Norte west of Louisiana (Figure 2). There are no parks or outdoor public gathering areas near the Coronado site. Residences to the south are more than 500 feet from the site, and are partially or completely screened from the site by trees.

The reclaimed water storage reservoir would be 32 feet high and 115 feet in diameter. This is only half the capacity of the existing, 32-foot-high, 165-foot-diameter potable water reservoir at Coronado site. The existing reservoir is sited at a slightly higher elevation than that planned for the reclaimed water storage reservoir.

The existing potable water storage reservoir is enclosed within a fenced area that has been landscaped with trees, shrubs, and bluegrass lawn around the reservoir. The new reservoir would also be within the fenced area. The fence has lockable gates that reduce the chance for graffiti and other similar writings to be painted on the reservoir.

3.6.2 Environmental Consequences

The following situation would be deemed an unacceptable adverse effect to aesthetics and visual resources:

- Location and size of project facilities that would block most of an existing viewshed.

The anticipated effects of the proposed project and its alternatives are summarized in Table 3.6-1. As the summary comparison indicates, there are no substantial differences in anticipated effects on aesthetics and visual resources between the two action alternatives. The residences on the north side of Watercress Drive would have the most direct view of the equalization reservoir site on the Honeywell facility. Wildflower Park is between these residents and the reservoir, and the parts of the park would also have a direct view of the site. The view from the residences and parts of the park would be partially screened by trees in the park. After the reservoir site was landscaped, the view from many of these residences would blend with the existing park vegetation. From the baseball fields, the reservoir site would be almost completely masked. With the implementation of the environmental design features discussed below, no substantial temporary, long-term, or cumulative adverse effects to aesthetics or visual resources would be expected for either of the action alternatives.

Construction and landscape treatments for the proposed equalization reservoir would specify masking the reservoir body by screening walls, mounding, planting of trees and shrubs, and restrictions on access. The view from the baseball fields would be primarily of the screening wall, mounding, and landscaping, at a long distance.

At the Coronado Reservoir site, the reclaimed water reservoir would be the same height, but sited at a lower elevation than the existing potable water reservoir. This site is surrounded by mature trees and landscaping on three sides. The north side is open to the recently-widened Paseo del Norte. Views of the new reservoir from residences to the south would be screened by the existing reservoir and trees.

The proposed reservoirs would be sited in the same locations for both action alternatives. With the implementation of the environmental design features discussed below, no temporary, long-term, or cumulative adverse effects to aesthetics or visual resources would be expected for either of the action alternatives.

For the No Action alternative, no facilities would be constructed, and no effects to aesthetics and visual resources would take place.

TABLE 3.6-1
SUMMARY OF ANTICIPATED EFFECTS TO AESTHETICS AND VISUAL RESOURCES

Evaluation Criterion	Alternative A	Alternative B	No Action
1. Approximate number of households within a 0.25-mile radius of a reservoir that would have an unobstructed view of a new structure.	25	25	0
2. Number of public use areas (parks) within 0.25 miles that would provide an unobstructed view of a new structure.	2	2	0

3.6.3 Environmental Commitments

Environmental Design Features

The following project design features would minimize or eliminate potential project effects to aesthetics and visual resources:

- Reservoir siting and site preparation will minimize vertical intrusion by incorporating lowered elevation (tank base set below surrounding grade) and blending with site contours.
- Appropriate landscaping and interposed wall structures, consistent with site access and security, will minimize visual effect.
- Appropriate reservoir and wall structure patterns and coloration will be used to minimize visual intrusion.
- Appropriate site access limitations and maintenance activities will be implemented to prevent vandalism and graffiti and to ensure continued visual minimization.

The same measures would be applied for either Alternative A or B.

3.7 TRAFFIC AND CIRCULATION

The project-related traffic and circulation environmental issues identified during scoping activities are listed in Table 3.1-1.

3.7.1 Affected Environment

The pipeline corridor for the two action alternatives would be located in the existing road rights-of-way of San Diego, San Mateo, North Jefferson, Wilshire, San Pedro, Tiburon, and Chappell Drive.

North Jefferson Street is a major north/south road west of I-25 and carries the most traffic of the streets listed above. It carries commuter traffic to all of the major businesses and manufacturing companies located along that street from Montgomery Boulevard to San Diego. North Jefferson Street is a four-lane road with a median divider between Alameda and the Journal

Center. It crosses two major intersections at Alameda and Paseo del Norte. The proposed pipeline would be placed along the west side of Jefferson Street and would extend about 8,000 linear feet for Alternative A and 6,000 linear feet for Alternative B.

The pipeline from the equalization reservoir located at the Honeywell facility to the storage reservoir at the Coronado Reservoir site would cross I-25 at Wilshire Street for Alternative A, and south of Paseo del Norte along the Domingo Baca Arroyo for Alternative B. The pipeline would be bored underneath I-25 at either of these locations, as well as at 12 other locations, including the two major intersections along North Jefferson. The required pipeline boring would encompass 1,650 linear feet for Alternative A and 2,350 feet for Alternative B. Construction of the pipeline would require removal and replacement of 15,090 linear feet of asphalt for the proposed project and 10,080 linear feet for the alternative project.

3.7.2 Environmental Consequences

The following situation would be deemed an unacceptable adverse effect on traffic and circulation:

- Project construction activities cause traffic delays that exceed City requirements.

The anticipated effects of the proposed project and its alternatives are summarized in Table 3.7-1. With their implementation, no temporary, long-term, or cumulative substantial adverse effects to traffic would be expected for either of the action alternatives. None of the alternatives are expected to exceed City traffic management standards.

Effects to traffic and circulation could include substantial delays or the need for detours or closings. The potential extent of traffic congestion from construction activities would be related to such factors as the total length of pipeline to be placed in streets (longer pipelines increase the area of disturbance and the potential for unacceptable adverse traffic congestion), the right-of-way width relative to the roadway width, the need to avoid existing utilities in the right-of way, and the number and type of intersections crossed.

Construction and installation of the pipeline are activities that would occur without substantial effects to traffic, provided the standard protective measures stipulated by the City's *Development Process Manual* (Albuquerque, City of, 1997) were implemented. Contractors routinely incorporate these protective measures into their standard construction procedures to minimize effects on traffic and delays to commuters. Examples include flexible work site scheduling, extended work hours, weekend versus weekday construction, and non-peak-hour construction.

Construction of the pipeline in or along street rights-of-way would be expected to cause some traffic congestion and slow-down in the following areas during the construction period. However, because the pipeline would be installed at the rate of 400 to 500 feet per day, traffic and circulation effects at any site would be temporary, lasting only 1 or 2 days. None of these sites would be anticipated to have traffic delays that would exceed City requirements

- North Jefferson is the major road providing access to businesses from the Journal Center to San Diego. Traffic is frequently heavy on this street during the afternoon rush hour and mid-day shift changes.

TABLE 3.7-1
SUMMARY OF ANTICIPATED EFFECTS TO TRAFFIC AND CIRCULATION

Evaluation Criterion	Alternative A	Alternative B	No Action
1. Number of intersection crossings (constructed or bored).	6	5	0
2. Length of pipeline to be installed in 2-lane streets (linear feet).	11,600	12,700	0
3. Length of pipeline to be installed in 4-lane streets (linear feet).	7,700	3,800	0

- Tiburon Street is a two-lane street with gravel shoulders. Cars are parked casually on both sides of Tiburon Street next to the Centex American Gypsum Company. When cars park on both sides, traffic is reduced to one lane. During the construction period, workers at nearby plants would need to find alternative places to park.
- The Hope Christian School and Edmund G. Ross Elementary School are located along Palomas Avenue, and construction of the pipeline would cause traffic congestion on Palomas Avenue and possibly San Pedro and Louisiana when children were dropped off and picked up from school.

The environmental design features discussed below are required by the City for construction projects. With their implementation, no temporary, long-term, or cumulative adverse effects to traffic would be expected for either of the action alternatives.

For the No Action alternative, no facilities would be constructed, and no temporary construction effects to traffic would take place.

3.7.3 Environmental Commitments

Environmental Design Features

The following project design features would minimize or eliminate potential project effects to traffic and circulation:

- The pipeline will be routed in existing utility rights-of-way to minimize the length and width of potential interference with traffic.
- The pipeline installation will be bored under several major intersection crossings to minimize traffic disruption.
- The construction contractor will be required to meet City requirement for preparing an impedance analysis and traffic/barricade plan, and will be required to implement appropriate work measures to ensure an adequate level of service on affected streets. Compliance with this measure is required to obtain City construction permits.

The same measures would be applied to either Alternative A or B. Environmental design features for control of traffic will be prepared in conjunction with measures for noise, in order to avoid potential cumulative effects of traffic control measures and noise-producing activities, and noise control measures and project effects on traffic (i.e., work hour extensions or restrictions).

3.8 BIOLOGICAL RESOURCES

The project-related biological resource issues identified during scoping activities are listed in Table 3.1-1.

3.8.1 Affected Environment

Lists of special status species, including federally and state-listed endangered, threatened, and candidate species, and species of concern for Bernalillo County, were obtained from the New Mexico Ecological Services Office of the U.S. Fish and Wildlife Service (USFWS) and from the New Mexico Game and Fish Department (NMGFD). The list of sensitive plants species from the New Mexico Forestry and Resources Conservation Division (NMFRCD 1995) for the county was also reviewed. Listed species are shown in Tables 3.8-1 and 3.8-2.

Project Area

There are no known examples or locations providing suitable habitat for any of the listed species in the project area. In addition, there are no known existing populations or concentration areas of these species within areas that would be close to anticipated project activities. Most of the proposed project area consists of business, commercial, and residential land uses.

Most of both pipeline routes are associated with concrete-lined arroyos, unlined but channelized arroyos, roads, and commercial and industrial properties. Because of the high concentration of development, the project area is considered to provide unsuitable habitats for the listed species.

The natural vegetation over the vast majority of the project area is characteristic of an upland grass-shrub plant community and contains species not typically adapted to wetlands, riparian zones and other areas that may be seasonally wet or have a high water table. Areas of original plant communities are largely lacking because of the high degree of past and current development.

Small remnants of native vegetation were observed east of I-25 and north of Alameda Boulevard. Plants in these areas include shrubs such as rubber rabbitbrush (*Chrysothamnus nauseosus*), hairy golden aster (*Chrysopsis villosa*), and fourwing saltbush and grasses such as sand dropseed (*Sporobolus cryptandrus*), purple three awn (*Aristida purpurea*), and Indian ricegrass (*Oryzopsis hymenoides*). No trees were noted in these areas.

The east-west trending arroyos that traverse the project area have been extensively modified through concrete lining and channelization. Most of the arroyo banks have been bermed and are now used for vehicle access and paved or unpaved hiking/biking trails.

With one exception, there is no vegetation associated with riparian habitats within the project area. Along the Alternative B proposed route there are a few cottonwood trees in a channelized arroyo east of I-25, west of San Pedro Drive and south of Paseo del Norte (Domingo Baca Arroyo). Cottonwoods are associated with potential riparian habitat. The line of trees is less than 75 meters long. These trees have grown in a low section of the arroyo channel where water persists long enough for establishment to take place.

TABLE 3.8-1
FEDERALLY-LISTED ENDANGERED, THREATENED, AND CANDIDATE SPECIES FOR BERNALILLO COUNTY

Common Name	Scientific Name	Federal Status	Critical Habitat
Black-footed ferret	*Mustela nigripes*	Endangered	No
American peregrine falcon	*Falco peregrinus anatum*	Endangered	No
Arctic peregrine falcon	*Falco peregrinus tundrius*	Endangered, similarity of appearance	No
Bald eagle	*Haliaeetus leucocephalus*	Threatened	No
Mexican spotted owl	*Strix occidentalis lucida*	Threatened	No
Mountain plover	*Charadrius montanus*	Candidate	No
Southwestern willow flycatcher	*Empidonax traillii extimus*	Endangered	Yes; none in Rio Grande basin
Whooping crane	*Grus americana*	Nonessential experimental	No
Rio Grande silvery minnow	*Hybognathus amarus*	Endangered	Proposed

TABLE 3.8-2
STATE-LISTED ENDANGERED AND THREATENED SPECIES FOR BERNALILLO COUNTY

Common Name	Scientific Name	State Status
Rio Grande silvery minnow	*Hybognathus amarus*	Endangered
Neotropic cormorant	*Phalacrocorax brasilianus*	Threatened
Bald eagle	*Haliaeetus leucocephalus*	Threatened
Common black-hawk	*Buteogallus anthracinus anthracinus*	Threatened
American peregrine falcon	*Falco peregrinus anatum*	Threatened
Whooping crane	*Grus americana*	Endangered
White-eared hummingbird	*Hylocharis leucotis borealis*	Threatened
Southwestern willow flycatcher	*Empidonax traillii extimus*	Endangered
Bell's vireo	*Vireo bellii*	Threatened
Gray vireo	*Vireo vicinior*	Threatened
Baird's sparrow	*Ammodramus bairdii*	Threatened
Spotted bat	*Euderma maculatum*	Threatened
New Mexican jumping mouse	*Zapus hudsonius luteus*	Threatened

The area surrounding this section of the arroyo is owned by a single developer. The developer is currently in negotiations with the City Department of Public Works to line this portion of the arroyo before summer 1999. In addition, standard City maintenance practice for arroyos under it's jurisdiction is to treat large shrubs and small trees in the arroyo with a herbicide, and remove them when they fail to leaf in the spring.

As a result either of common maintenance practices or arroyo lining, these trees would not be in the arroyo when the Alternative B pipeline project would be constructed.

The small remnant areas of natural vegetation do not represent unique or rare plant communities such as riparian bosque and prairie grassland. The small sizes of naturally-vegetated areas, high degree of habitat fragmentation, and intense disturbance in the surroundings strongly indicate these areas are not of high importance to listed animal species for habitat or foraging.

There are no jurisdictional wetlands or substantial riparian areas present in the project areas that are likely to be affected by either of the action alternatives.

Rio Grande Evaluation Area

The potential reduction in downstream flows in the Rio Grande, as a result of the decreased discharge of treated wastewater effluent from the City's Southside Water Reclamation Plant, resulted in the project evaluation area being extended beyond the immediate project area to include the Rio Grande channel from the wastewater treatment plant discharge to the Isleta Diversion Dam. This reach of the river is known to be habitat for the endangered Rio Grande silvery minnow (USFWS, 1998), and river flow supports adjacent riparian habitat and wetlands along portions of the banks of the river. This reach of the river has been proposed as part of the designation of critical habitat for the Rio Grande silvery minnow (USFWS, 1999).

3.8.2 Environmental Consequences

The following situations would be deemed an unacceptable adverse effect to biological resources:

- Loss or substantial degradation of supporting habitat.
- Loss of individual members of a population of a listed species.

Concerns regarding wetlands and riparian areas were not expressed during scoping for this project, probably because project facilities would not be located in areas supporting these resources.

The anticipated effects of the proposed project and its alternatives are summarized in Table 3.8-3.

Project Area

The areas to be affected by the proposed project in the immediate project area are already highly disturbed and have high levels of human activity. Noise from construction may disturb urban wildlife species but are not expected to affect special status species.

TABLE 3.8-3
SUMMARY OF ANTICIPATED EFFECTS TO BIOLOGICAL RESOURCES

Evaluation Criterion	Alternative A	Alternative B	No Action
1. Total number of federal-listed species that are potentially affected.	1	1	0
2. Total number of state-listed species that are potentially affected.	1	1	0
3. Net reduction of flow in the Rio Grande during low flow periods as a result of using reclaimed wastewater for turf irrigation and other uses (percent).	0.19	0.19	0

Neither of the action alternatives would have any direct or indirect effects to threatened, endangered, or candidate species; or to wetlands in the immediate project area. No sensitive species or potential habitat were observed in the project area. There were no wetlands present along either project corridor.

Rio Grande Evaluation Area

An indirect effect of the proposed action will be the reduction in flow volume of treated wastewater from the City's Southside water reclamation plant (Table 3.5-2). This reduction in flow from the water reclamation plant will result in an annual average flow depletion below the discharge of approximately 448 ac-ft/yr. The Rio Grande between Cochiti Reservoir and the AT&SF Railroad Bridge at San Marcial is proposed critical habitat for the endangered Rio Grande silvery minnow (USFWS, 1999). The draft Recovery Plan prepared by the USFWS for the Rio Grande silvery minnow identifies flow depletions in the Rio Grande as one of the primary threats to the species (USFWS, 1998).

An Endangered Species Act (ESA) Section 7 consultation was conducted with the USFWS regarding the potential effects of implementing the water reclamation project on the Rio Grande silvery minnow and its habitat (Appendix G). The consultation determined that the Rio Grande silvery minnow may be affected by the potential downstream depletion of flows resulting from the proposed project, but that habitat enhancement measures would avoid or minimize effects to the species.

The potential decrease in river flow below the wastewater treatment plant discharge (a maximum of 0.2 percent of the flow in the river [Table 3.5-2]) would be well within the long-term variability of river flows during these months, and would not be considered potentially adverse to riparian communities or wetlands along the river.

The No Action alternative would not affect threatened and endangered species, wetlands, or riparian areas because no site alterations or flow depletions would occur with this alternative.

3.8.3 Environmental Commitments

Environmental Design Features

The following project design features will act to minimize or eliminate potential project effects to biological resources:

- Project pipeline alignments have been routed primarily in developed public rights-of-way to minimize activity in undisturbed areas.

Mitigation Measures

With implementation of the listed design features, no substantial adverse effects to biological resources in the immediate project area are anticipated for either action alternative. Therefore, no mitigation measures are recommended. There are no anticipated long-term operation effects to these specific biological resources associated with either of the action alternatives that would require mitigation measures.

As a result of the ESA Section 7 consultation, mitigation measures that are recommended to avoid or minimize potential effects of the proposed project to the Rio Grande silvery minnow include the following.

- The City of Albuquerque will create winter habitat structures in the river of a design and configuration thought to be effective in providing effective habitat for winter survival of the Rio Grande silvery minnow (USFWS, 1998). The final design and configuration of the structures will be developed in conjunction with the USFWS. Structures will be in place in November 1999. Monitoring of Rio Grande silvery minnow abundance associated with these structures will be conducted over a three-month period during the winters of 1999-2000 and 2000-2001, at a frequency and methodology to be developed with the USFWS.

Implementation of these measures will avoid and minimize the effect of the proposed project on the Rio Grande silvery minnow and other biological resources.

3.9 SOILS AND VEGETATION

The project-related soil and vegetation environmental issues identified during scoping activities are listed in Table 3.1-1.

3.9.1 Affected Environment

Large turf grass areas such as parks, golf courses, and athletic fields are managed so that water is applied at a rate and volume necessary to maintain the health of the turf. Without proper management, salts included in the irrigation water would eventually accumulate in the subsurface. In temperate areas, precipitation leaches accumulated salts below the root zone. However, in arid locations such as Albuquerque, precipitation is not sufficient to leach salts. Salts in the root zone of the turf grass would eventually affect its growth.

With proper turf grass management practices, enough leaching water is applied to flush salts below the root zone. Salts accumulate below the root zone as the irrigation water evaporates into the pore space.

The salinity and sodium hazard of irrigation waters to plants can be evaluated through measurements of the TDS, electrical conductivity (EC) and sodium adsorption ratio (SAR). Plant species exhibit a wide range of inherent tolerances to soil salinity, which is the reason that the EPA (1992) standard for irrigation water uses is expressed as a range of TDS values from 500 to 2,000 mg/L.

Irrigation waters with a TDS greater than 500 mg/L and an EC greater than 4 millimhos per centimeter (mmhos/cm) may represent a salinity hazard for sensitive plant species growth (Salinity Laboratory Staff, 1954). Salinity affects the osmotic potential of the soil water and the ability of the plant to extract the water from the soil solution.

Sodium in irrigation waters affects plant growth and availability of water through deterioration of the soil structure, aeration, infiltration, and permeability rates. The amount of adsorbed sodium in the soil is denoted by a SAR value, which is the proportion of sodium ions to calcium and magnesium. SAR values exceeding 10 to 15 indicate a potential sodium hazard in the soil or irrigation water (Salinity Laboratory Staff, 1954).

Fluorine toxicity to plants is unusual but can occur in acid soils. Toxic effects to plants have been reported when fluoride levels of 30 to 300 parts per million (ppm) were reported in the dry weight tissue of the plants (Gough *et al*., 1979).

The soils in the project area consist of a surface layer of fine sandy loams 18 to 20 inches deep that overlay sandy clay loams and gravelly sands that range from 20 to more than 60 inches deep. These soils:

- are well-drained to excessively drained;
- have moderately slow to rapid permeability's of 6.0 to 20.0 inches per hour;
- have water-holding capacities of 3 to 13 inches of water per inch of soil;
- have EC values of 0.7 to 1.1 mmhos/cm; and
- have SAR values of 0.14 to 0.20 (Hacker, 1977; National Soil Survey Laboratory, 1998).

The soils in the project area are represented by four soil series. The turf areas proposed for irrigation are located in the Bluepoint Kokan association (25 percent), Embudo series (20 percent), and Embudo Tijeras complex (55 percent). The pipeline construction in open areas and along the arroyos would be located in the soil series listed above, plus the Wink Embudo association.

The soils in the project area that would be irrigated with the reclaimed water are well suited for irrigation, have low salt and sodium content, and are not classified as saline or alkaline soils (Hacker, 1977). Potential soil limitations in the area of the project include the following.

- The soils that would be irrigated for turf grasses at the Balloon Fiesta Park, Sandia Prep School, and Sundt Corporation are subject to blowing and the surface soil is considered poor as a topsoil because of sandy conditions.
- The soils that would be irrigated for turf grasses at the Coronado Village, new baseball fields, police athletic field, AMTECH, Journal Center, Motorola Ceramics, and private soccer field are considered poor as a topsoil because of sandy conditions.

- The soils along the AMAFCA Canal that would be disturbed during pipeline construction have severe limitations for excavation due to bank caving, and moderate to severe wind and water erosion potential due to fine, sandy conditions.

The environmental consequences of potential soil wind and water erosion are discussed in the air quality and water quality sections.

The Balloon Fiesta Park, ball fields, and soccer fields are planted with a mixture of bluegrass, ryegrass, and fescues. Bluegrasses are classified as moderately sensitive to irrigation waters with elevated water salinity (reactions threshold at 3 mmhos/cm) and perennial ryegrass and red fescue are classified as moderately tolerant to elevated irrigation waters salinity (reaction threshold approaching 10 mmhos/cm) (EPA, 1992). Tree species are present at Wildflower Park, Coronado Village Golf Course, and around the Journal Center. All of these species perform well under drought conditions, and are tolerant of a wide range of soil conditions, including alkaline and saline soils (Dirr, 1990).

Field observations of proposed irrigation sites conducted in August 1998 did not identify any areas proposed for turf irrigation that suggested evidence of turf grass growth limitations because of saline or sodic soil conditions. The poor condition of the vegetation at the Coronado Village Golf Course was assumed to be the result of poor water management practices and not the result of adverse soil conditions.

3.9.2 Environmental Consequences

An effect to soil and vegetation resources would be considered an effect if one or more of the following conditions occurred:

- The reclaimed water would not be suitable for irrigation and would result in a buildup of salts in the root zone.
- The concentrations of dissolved salts and fluoride in the reclaimed irrigation water would affect plant growth.

The anticipated effects of the proposed project and its alternatives are summarized in Table 3.9-1. As the summary comparison indicates, there are only minor differences in anticipated effects to soils and vegetation among the alternatives.

The potential irrigation suitability of reclaimed water for turf grass irrigation was determined by comparing the average concentrations of the blended water quality parameters to EPA (1992) standards for irrigation water uses, guidelines for use on golf courses (United States Golf Association, *et al*., 1994), and to the salinity exposure guidelines of the National Soil Salinity Laboratory (no date). The effects of such water application was determined by comparing the salinity tolerances of plant species to the chemistry of the reclaimed water. The intent was to determine if one or more parameters were likely to cause reduced turf grass growth or increased turf grass mortality.

Existing water quality information for reclaimed water indicated that average concentrations of blended water for TDS and fluoride parameters would exceed EPA standards for irrigation use.

TABLE 3.9-1
SUMMARY OF ANTICIPATED SOIL RESOURCE EFFECTS

Evaluation Criterion	Alternative		
	A	B	No Action
1. Number of average water quality parameters that exceed EPA water quality standards for irrigation water use.	2 (TDS and fluoride)	2 (TDS and fluoride)	0

- The EPA (1992) TDS standard ranges from 500 to 2,000 mg/L and the fluoride standard is 1.0 mg/L.
- The average TDS concentration of the reclaimed water was about 656 mg/L and the average concentration of fluoride was 3.63 mg/L.

All other water quality parameters were below their respective irrigation standards or are not regulated by the EPA or state for irrigation purposes.

Use of the reclaimed water with an average TDS concentration of about 660 mg/L would not be expected to adversely affect existing turf grass conditions for the following reasons.

- The average TDS concentrations of the blended reclaimed water exceed the lower end of the EPA range (500 mg/L). However, this threshold was set to protect the most sensitive plant (i.e., crop) species from adverse effects of using irrigation water with elevated salinity (U.S. Environmental Protection Agency, 1992).
- The average TDS concentration of the reclaimed water is below the New Mexico WCC ground water standard of 1,000 mg/L.
- The lower salinity sensitivity threshold for bluegrass is approximately 3,000 mg/L TDS and the lower threshold for red fescue and perennial ryegrass is about 10,000 mg/L TDS (U.S. Environmental Protection Agency, 1992; CH2M Hill, 1999). These are the dominant turf grasses used in the proposed irrigation sites. All of these values are well above the average TDS concentration of the reclaimed water of about 660 mg/L.
- Moderately sensitive plant species such as bluegrass tolerate irrigation waters containing 700 mg/L TDS (McKee & Wolf, 1963). This is above the average TDS concentration of the reclaimed water of 656 mg/L.

Based on these regulatory values and effect levels of the predominant grass species at the sites, adverse water quality effects to the present dominant turf grasses would not occur. This conclusion assumes that the City continues its present water management plan to avoid salt accumulation in the upper 6 to 10 feet of the soil profile.

SAR values exceeding 10 to 15 generally indicate a potential sodium hazard in soils or irrigation water (Salinity Laboratory Staff, 1954). The SARs of the reclaimed water (3.16) and of soils in the turf areas (0.20) are well below this range, indicating that detrimental effects from sodium salts would not occur. The irrigation sites would not sustain the detrimental effects of

excessive sodium, such as reduced soil permeability, decreased water infiltration rate, or increased osmotic pressure as a result of salts in the reclaimed water.

The average fluoride concentration of 3.63 mg/L in the blended reclaimed water exceeds the EPA (1992) standard of 1.0 mg/L. However, fluoride salts have been reported to produce toxic effects to plants only in soils with pH values below 5.5, but not in neutral or basic soils with pH values in excess of 6.0 (U.S. Environmental Protection Agency, 1972). The soils in the turf areas are slightly basic, with pH values ranging from 7.4 to 8.4. Under these soil pH conditions, the fluoride would not exist in a soluble form that would be available to affect plant growth. Therefore, no adverse effect to the irrigated areas would be anticipated from the fluoride concentrations in the reclaimed water.

Fluorides also would not result in adverse effects because of the City's present irrigation management plan. Any fluoride applied beyond the adsorption capacity of the roots would be flushed through the rooting zone and would accumulate with other salts in deep soil layers as the irrigation water evaporated.

3.9.3 Environmental Commitments

Environmental Design Features

Adverse effects to plant growth from the buildup of salts in the soil would be controlled by continuation of the City's present water management plan, which involves leaching salts out of the upper 6 to 10 feet of the soil profile. (CH2M Hill, 1999). The City would require water application agreements and monitoring plans from the private water users to ensure that reclaimed water applications on their properties would be sufficient to leach the salts below the root zone. Specific water management elements would include the following.

- Guidance from the City regarding irrigation management will be provided to all reclaimed water users.
- As part of the irrigation water supply contract the City signed with all users, the City will monitor monthly the metered use of reclaimed water versus user acreage, focusing on indications of too little use of water (potential topsoil salt accumulation from inadequate leaching) or too much use (resulting in potentially flushing the salts down into the ground water).
- The City will coordinate and review monthly irrigation management reports from the City Parks and General Services Department, other City users, and all private users, indicating area watered and amount of reclaimed irrigation water applied.

3.10 CULTURAL RESOURCES

The project-related cultural resources environmental issues identified during scoping activities are listed in Table 3.1-1. Because the project will be partially paid for with federal funds, the project planning, construction, and maintenance must comply with the National Historic Preservation Act of 1966, as amended (NHPA). This law and its accompanying regulations outline a process for identifying, evaluating, and mitigating adverse effects of a project on significant cultural resources.

3.10.1 Affected Environment

A background site records search of the Archaeological Records Management Section (ARMS) of the SHPO found that a number of cultural resources have been previously documented within the project area. Within 1.0 mile of the proposed project site, nine prehistoric and historic cultural sites have been previously recorded. Several of these are pre-Columbian roomblocks and pueblos. These sites are listed in Table 3.10-1. None of these sites would be directly bisected by either of the action alternatives.

Much of the evaluation area is highly disturbed by modern construction and substantial ground-moving in the area. This does not eliminate the possibility of encountering subsurface cultural deposits. However, the probability of accurately predicting the location of these resources is diminished because the area is disturbed, and archaeologists are less likely to be able to detect subsurface deposits from the surface. Distances from previously-recorded sites to the nearest proposed pipeline corridor are included in this table.

Much of the proposed distribution system route would be located on the first primary topographic bench east of the Rio Grande. This is a prime environmental location for both pre-Columbian pueblos and other residential features, as well as for specialized procurement sites, such as raw material procurement loci. Thus, there is a very high potential for encountering evidence of past pre-Columbian use of this area.

The historic irrigation system, also known as the Middle Rio Grande Conservancy District, had and continues to have widespread distribution. These systems are important in that they are "associated with events that have made a significant contribution to the broad patterns of our history" and have "made a measurable impact on local life" (SWCA, Inc., 1997). The Middle Rio Grande Conservancy District irrigation system has been recommended as eligible to be included in the National Register of Historic Places (NRHP) by its age, its historic and engineering significance, and its integrity (SWCA, Inc., 1997). The historic canals have not been assigned Laboratory of Anthropology site numbers (SWCA, Inc., 1997).

Irrigation systems were the primary method of agriculture for Hispanic and Euro-American settlers in the region, and their construction may date to as early as the seventeenth century. This irrigation system was integral to the survival of non-indigenous settlements of the area, and allowed those settlements to prosper and grow into the modern-day city and towns that are located along the Rio Grande. Most of these features have been remodeled, removed, or destroyed during reconstruction and paving of the flood control and irrigation system as a whole retains its historic importance.

The Middle Rio Grande Conservancy District and Reclamation both maintain records on the existing irrigation system, which can be compared with plans for each alternative to determine the specific effects of the alternatives on the irrigation system.

3.10.2 Environmental Consequences

The following situation would be deemed an unacceptable adverse effect to cultural resources:

- A pre-Columbian or historic cultural resource (including the MRGCD irrigation system) would be adversely affected if a potentially-eligible site or human remain was disturbed or destroyed without completion of an approved data recovery program.

TABLE 3.10-1
PREVIOUSLY-RECORDED CULTURAL RESOURCES SITES
WITHIN 1 MILE OF THE PIPELINE CORRIDOR [a/]

Site Number	Affiliation	Cultural Resource
LA[b/] 421	Anasazi-Recent Historic (1100 AD-present)	Alameda Pueblo
LA 715	Anasazi-Historic	Roomblock
LA 716	Anasazi-Historic	Puaray Pueblo
LA 20188	Territorial (1846-1912 AD)	Kroeber House, Tomasa Griego de Garcia House
LA 50245	Territorial (1846-1912 AD)	Casa Corral
LA 56119	Recent Historic (1945 AD-present)	Trash scatter
LA 74744	Statehood (1912-1945 AD)	Historic and prehistoric; no additional information is available
LA 85052	Statehood (1912-1945 AD)	Trash scatter
LA 87058	Anasazi-Historic (1450-1945 AD)	Lithic, ceramic, trash scatter

a/ Source: State of New Mexico, Historic Preservation Division records.
b/ Acronyms and abbreviations:
AD *anno domini*
LA Laboratory of Anthropology, New Mexico Historic Preservation Division

The anticipated effects of the proposed project and its alternatives are summarized in Table 3.10-2. As the summary indicates, the primary differences in anticipated effects to cultural resources among the alternatives are related to the length of the construction disturbance associated with the distribution system route. A longer route would have a proportionately greater potential to disturb cultural resources.

Neither of the action alternatives would directly effect any of the previously-registered sites listed in Table 3.10-1. However, either development alternative has the potential to encounter and adversely affect other potentially-eligible sites or cultural resources associated with the previously-registered sites that have not been recorded. Further, either development alternative could encounter subsurface resources that are not visible from the present-day ground surface or could affect portions of the historic irrigation canals. The proportion of undisturbed ground surface that would be disturbed by construction for Alternatives A and B are 20 percent and 30 percent, respectively. While the project would do little damage to the historic irrigation system channels, water control devices such as checks, gates, drops, flumes or bridges associated with irrigation canals could be affected.

For both action alternatives, the proposed route does not cross any known sites previously registered with ARMS. The irrigation system, currently under the jurisdiction of the MRGCD, has been recommended as eligible for nomination to the National Register of Historic Places. If the proposed route crosses a feature related to the system, it will be recorded as per the guidelines issued by SHPO on January 5, 1999 (SHPO, 1999).

TABLE 3.10-2
SUMMARY OF ANTICIPATED EFFECTS TO CULTURAL RESOURCES

Evaluation Criterion	Alternative A	Alternative B	No Action
1. Total length of distribution system route that would be disturbed by construction (linear feet)	42,800	55,000	0
2. Total length of undisturbed ground surface along the pipeline route (linear feet)	8,580	16,583	0
3. Number of potentially-eligible cultural resources sites likely to be effected by construction activities.	unknown	unknown	0

For the No Action alternative, no facilities would be constructed. Therefore, no construction effects to cultural resources would take place.

3.10.3 Environmental Commitments

Environmental Design Features

The following project design features would minimize or eliminate potential project effects to the known or undiscovered cultural resources described in the previous section:

- A pedestrian survey and cultural resources documentation will be conducted prior to construction in those sections of the proposed project area that exhibited undisturbed ground surface. An undisturbed ground surface is defined as a landscape surface without extensive human-caused modification. Any cultural resources found during this survey will be documented and evaluated as to their national Register eligibility. Reclamation will consult with SHPO regarding the eligibility of these sites. The inventory phase of the project will also identify specific MRGCD facilities that will be affected by the project. Any eligible sites or portions of the irrigation system will either be avoided by realigning the project, or a data recovery plan approved by Reclamation and SHPO will be implemented to mitigate the adverse effects of the project on the sites.
- Before ground disturbing construction work takes place a meeting will be arranged to inform construction crews of the potential for disturbing subsurface cultural resources and of procedures involved in the event that this occurs. This will be especially important with regard to exhuming human remains.
- A cultural resources discovery plan will be prepared and finalized through consultation with the Reclamation and the SHPO, prior to the beginning of construction. The plan will outline procedures for protecting newly discovered cultural resources, evaluating their importance, and avoiding or mitigating the project's adverse effects to them. The plan will also detail procedures for complying with the Native American Graves Protection and Repatriation Act (NAGPRA), in case human remains are discovered.

Mitigation Measures

As described above, any significant cultural resources that will be affected by the project will be either avoided by project realignment, or will be documented through implementation of an approved recovery plan. Along with project realignment, avoidance may include temporary fencing and archaeological monitoring of construction in the vicinity of significant resources. Data recovery may include mapping, photography, surface collection, excavation, and historic document research.

Mitigation measures that are recommended to avoid or minimize adverse effects to cultural resources include the following.

- In addition to avoidance and data recovery, precautions will be taken to make sure archaeological assistance is immediately available in case of a discovery. The discovery plan approved by Reclamation and SHPO will outline these precautions in detail. Work at the site will cease if cultural resources were unearthed during construction activities in these areas. The archaeologist will respond to a telephone call from the site to evaluate the unearthed materials and insure that any uncovered cultural resources were appropriately recorded or avoided, based on the discovery plan referenced above. Work at the site will resume after such recording or avoidance was completed.

Implementation of these measures will avoid and reduce the effect of the construction activity on cultural resources. There are no anticipated long-term operation effects to cultural resources associated with either of the action alternatives that will require mitigation measures.

3.11 SOCIOECONOMIC FACTORS

The project-related socioeconomic issues identified during scoping activities are listed in Table 3.1-1.

3.11.1 Affected Environment

The AWRMS was adopted by the City Council on April 24, 1997. The total estimated cost for the AWRMS is estimated at $180 million. Water reclamation and reuse projects were estimated at $27.6 million of the total (15.3 percent).

Funding for the project is to come from a series of dedicated water rate increases for 7 years. The approach to funding the implementation of the strategy was that a series of rate increases will be easier to implement than one large increase, and that the funding for the implementation will come in stages, as opposed to trying to accomplish all of the funding in one year. The City Administration and the City Council must support the rate increases each year.

The first rate increase of 4.7 percent went into effect on May 1, 1998. The second increase, also 4.7 percent, has been approved by the Council and went into effect on May 1, 1999.

The proposed method of payment for implementing the AWRMS includes cash, bond and grant financing, and contributions from private industry. Because the rate increases are incremental, the effect on an annual basis will be relatively small.

3.11.2 Environmental Consequences

The following situation will be deemed a unacceptable adverse effect to social and economic characteristics of the project area:

- Rate increases for implementation of the proposed project that are an economic hardship for City water customers.

The anticipated effects of the proposed project and its alternatives are summarized in Table 3.11-1. As the summary comparison indicates, there are no differences in anticipated socioeconomic effects among the project alternatives.

In 1998, the average monthly household water bill in homes served by the City was $31.83. This rate is lower than other cities in New Mexico. It about one-third of Santa Fe's average water bill and about two-thirds of the average water bill from other water providers in the greater Albuquerque area (CH2M Hill, 1997d). It is also lower than many major cities in the Southwest. The overall AWRMS-related cost increases in monthly water bills is expected to be 36.4 percent, implemented over 7 years. This will raise the average monthly bill by $11.58 to $43.41.

The incremental cost of the proposed action represents 2.78 percent of the total estimated expenditure for capital improvements for the implementation of the AWRMS. Multiplying this percentage by the increase in the average monthly bill results in a $0.32 per month increase in the average water bill that would be attributed to the proposed action. This cost would be implemented over 7 years, for an average increase of approximately 4½ cents per month each year. This increase for the proposed action is approximately 0.16 percent of the average monthly water bill per year.

For the No Action alternative, no facilities would be constructed, and none of the effects to socioeconomic conditions related to project implementation would take place. However, the No Action alternative has potentially serious long-term consequences, as the proposed reclamation project is the first step in implementing the decisions made for the overall AWRMS. While this particular project represents only a small fraction of the overall improvements, it is an important first step in implementing a sustainable water supply strategy.

The costs of selecting the No Action alternative (i.e., not implementing the City's long-term water management strategy) would be associated with continued ground water depletion, subsequent water shortages, and the potential for land subsidence due to overpumping of ground water, and subsequent damage to buildings and infrastructure (Figure 5). These total costs could exceed the total cost of AWRMS strategy implementation (CH2M Hill, 1997d). While the total cost of *not* implementing the AWRMS cannot be attributed to taking no action on this proposed project, the *incremental* cost per household of selecting such a path can be justified as at least equal to the *incremental* cost of the proposed action.

Therefore, the cost to ratepayers of selecting the No Action alternative is estimated to be equivalent to the cost of implementing the proposed action – an average of $0.32 per month per customer over the planned period of implementation (Table 3.11-1).

TABLE 3.11-1
SUMMARY OF ANTICIPATED EFFECTS TO SOCIOECONOMIC CONDITIONS

Evaluation Criterion	Alternative		
	A	B	No Action
1. Cost of additional rate increase to fund this specific project (dollars per month per household)	$0.32	$0.32	$0.32

3.11.3 Environmental Commitments

Environmental Design Features

The following project design features would minimize potential project effects to socioeconomic conditions.

- Facility plans and specifications developed for the project will be designed to minimize project costs while meeting all of the project objectives.

3.12 NOISE AND VIBRATION

The project-related noise and vibration environmental issues identified during scoping activities are listed in Table 3.1-1.

3.12.1 Affected Environment

Noise from construction activities would be expected for a short time during construction of the water system pipeline and storage reservoirs. The pipeline would pass through residential, industrial, and school areas. Schools and residential areas usually are more sensitive to noise than are industrial, roadway, and business areas. Residential areas that could experience increased levels of noise include the Wildflower Community along North Jefferson, the Coronado Village mobile home park south of Wilshire Avenue on the west side of I-25, and the residential area along Wilshire Drive east of I-25. The construction site for the water storage reservoir at the Coronado Reservoir is adjacent to the Hope Christian School and Edmund G. Ross Elementary School.

3.12.2 Environmental Consequences

The following situation would be deemed an unacceptable adverse effect from noise and vibration :

- Noise and vibration from construction activities from the project exceeds City noise standards.

The anticipated noise and vibration effects of the proposed project and its alternatives are summarized in Table 3.12-1. As the summary comparison indicates, there would not be any substantial differences in anticipated noise effects among the alternatives. None of the alternatives would be expected to exceed existing City noise standards.

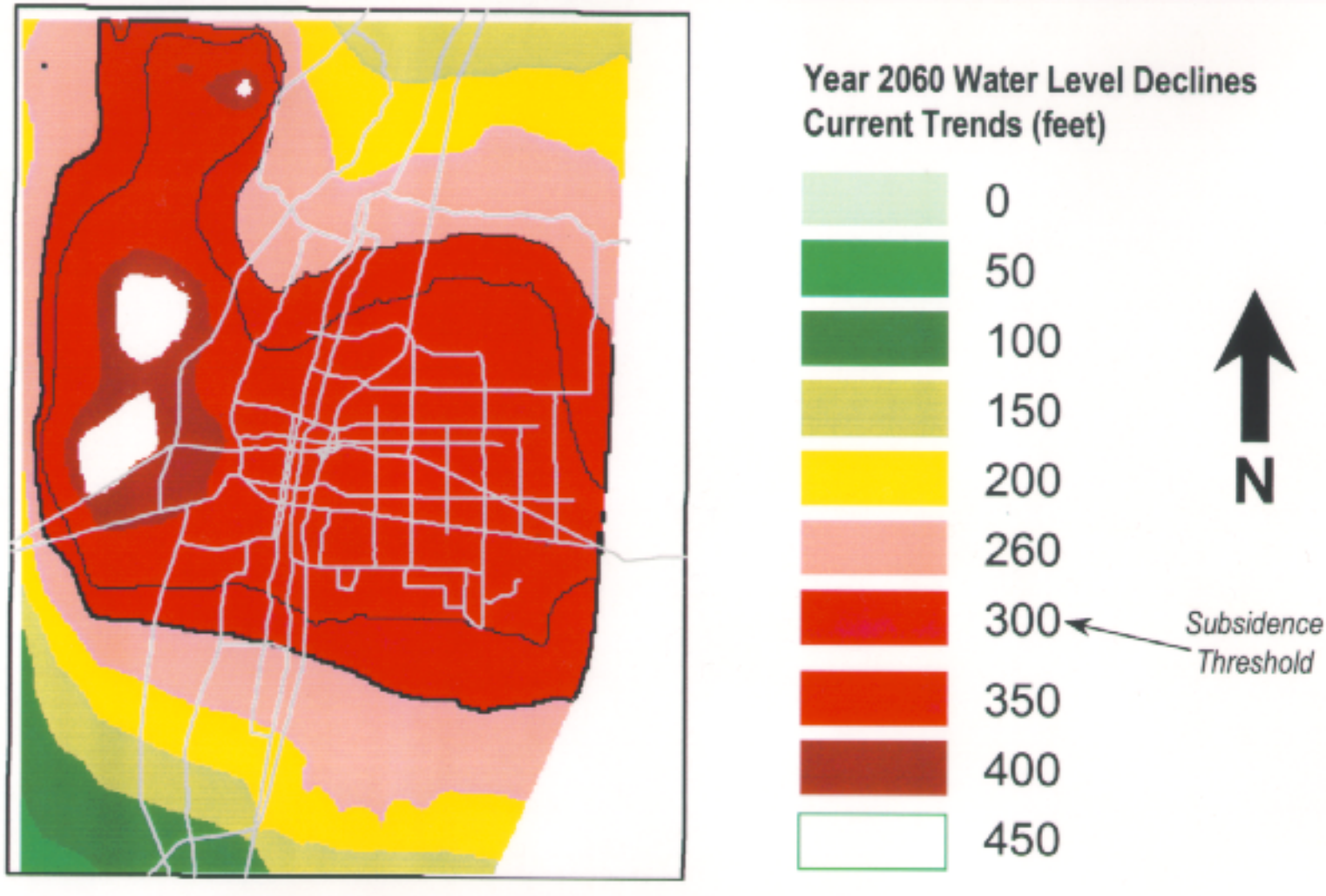


Figure 5 - Potential future effects of the 1960s Plan:
Water Level Declines in the Albuquerque Metropolitan Area

TABLE 3.12-1
SUMMARY OF ANTICIPATED EFFECTS TO NOISE AND VIBRATION

Evaluation Criterion	Alternative		
	A	B	No Action
1. Length of pipeline to be installed in streets within 500 feet of residences (linear feet).	7,500	2,750	0

Construction and installation of pipeline and reservoirs are activities that would occur without substantial effects to ambient noise levels provided that the standard protective measures stipulated by the City's *Development Process Manual* (Albuquerque, City of, 1997) and Noise Ordinance (ACC §6-22; Albuquerque, City of, 1981) were complied with. Protective measures are routinely incorporated into standard construction procedures to minimize noise from construction activities. In general, environmental controls for noise are directed at limiting the noise profile of construction equipment by specifying control practices to be implemented by the construction contractor in residential areas. The City conducts periodic noise testing at construction sites, and contractors are required by their contract with the City to conform to the requirements of ACC §6-22. As a general rule of practice, the City also restricts construction working hours within 500 feet of residential areas and sensitive receptors (R. Mitzelfelt, City of Albuquerque Environmental Health Department, personal communication).

The City has no noise standards for activities in commercial/industrial areas, other than conformance with ACC §6-22.

The potential opportunity for the violation of noise criteria from construction activities would be related to the total length of pipeline to be placed in City streets. A longer pipeline would increase the area of disturbance and the potential for noise emissions to exceed noise standards or become temporary nuisances. Because the pipeline would be installed at the rate of 400 to 500 feet per day, noise and vibration effects at any site would be temporary, lasting only 1 or 2 days. Pipeline segments located in or along residential streets would potentially result in greater noise exposures than segments located along undeveloped, open land.

The environmental design features discussed below are required by the City for construction projects. When these features are implemented, no temporary, long-term, or cumulative adverse effects from noise levels would be expected from either of the action alternatives. Residences are generally more than 500 feet from the Coronado Reservoir site, and no adverse noise effects would be expected over that distance.

The proposed activity does not include vibration-causing activities that would affect the integrity of structures. Therefore, no problems with vibration from project construction or operation would be expected.

For the No Action alternative, no facilities would be constructed, and none of the temporary construction effects from noise and vibration would take place.

3.12.3 Environmental Commitments

Environmental Design Features

The following project design features are required by the City for construction projects. Compliance with these measures is required to obtain City construction permits. These features, when implemented, would minimize or eliminate potential project effects from noise and vibration:

- The construction contractor will have to meet the noise ordinance requirements of the City (ACC § 6-22) for noise control on construction equipment.
- The contractor will adhere to project work hour restrictions (work allowed only between 7 a.m. to 10 p.m.) within 500 feet of residences, hospitals, schools, churches, and libraries.
- The contractor will arrange the construction schedule to restrict the number of days in a work location within 500 feet of the same residence, hospital, school, church, or library to four days.

The same measures would be applied to either Alternative A or B.

Environmental design features for control of noise would be prepared in conjunction with measures for traffic, in order to avoid potential cumulative effects of traffic control measures and noise-producing activities, and noise control measures and project effects on traffic (i.e., work hour extensions or restrictions).

3.13 HUMAN HEALTH AND SAFETY

The project-related human health and safety environmental issues identified during scoping activities are listed in Table 3.1-1.

3.13.1 Affected Environment

The users of the reclaimed water generated by the proposed project were detailed in Section 2, Proposed Action and Alternatives. The locations of these users were shown on Figure 2. The potential users of the reclaimed water for turf irrigation include parks, schools, and playing fields.

3.13.2 Environmental Consequences

The following situations would be deemed an unacceptable adverse effect to human health and safety:

- Cross-connection of reclaimed water and drinking water systems such that people were directly exposed to reclaimed water.
- Exposure to reclaimed water that resulted in direct effects to human health.

The anticipated effects of the proposed project and its alternatives are summarized in Table 3.13-1. When these features are implemented, no temporary, long-term, or cumulative adverse effects to human health and safety would be expected for either of the action alternatives. None of the alternatives would be expected to cause public health problems.

TABLE 3.13-1
SUMMARY OF ANTICIPATED EFFECTS TO HUMAN HEALTH AND SAFETY

Evaluation Criterion	Alternative		
	A	B	No Action
1. Number of reclaimed water quality parameters that would exceed secondary drinking water quality standards.	2	2	0

Potential public health problems could result if the reclaimed water used for irrigation was accidentally cross-connected into the drinking water system, or if people were exposed to irrigation water when it was in use for turf irrigation. Although the incidental exposure of people to watering would be minimal, the potential to affect health was examined by comparing the quality of reclaimed water for irrigation with quality requirements for drinking water.

Table 3.13-2 indicates that the reclaimed water would not exceed any of the primary drinking water standards, which are promulgated as mandatory health-related standards by U.S. Environmental Protection Agency (EPA) (1997). The irrigation water would not exceed any secondary drinking water standards except for fluoride and total dissolved solids (TDS). Secondary standards are promulgated by the EPA (1997) as aesthetic standards. Exceedence of these standards may be objectionable in terms of taste or odor, but the water would not be hazardous to health. For potable water systems, exceedence of secondary standards for drinking water requires that notices be sent to customers.

The exceedence of the secondary standard for TDS would be an aesthetic concern, not a health concern. While a TDS level of 500 mg/L is recommended for drinking water (California Code of Regulations [CCR], 1995); a level between 500 and 1,000 mg/L is acceptable. Short-term uses at concentrations up to 1,500 mg/L are recognized as acceptable. Incidental exposure to the concentrations expected in the irrigation water of 656 mg/L would not be harmful.

The environmental design features discussed below are required by the City for construction projects involving water supply lines. When these features are implemented, no temporary, long-term, or cumulative adverse effects to human health and safety would be expected for either of the action alternatives.

For the No Action alternative, no facilities would be constructed, and none of the potential operation effects to human health and safety associated with the use of reclaimed water would take place.

3.13.3 Environmental Commitments

Environmental Design Features

The following project design features are required by the City for construction projects involving water supply lines. These features, when implemented, would minimize or eliminate potential project effects to human health and safety:

TABLE 3.13-2
COMPARISON OF RECLAIMED INDUSTRIAL WATER QUALITY AND DRINKING WATER STANDARDS

Parameter	Sumitomo Water [a/]	Silmax Water [a/]	Philips Water [a/]	Blended Water [a/]	Primary Drinking Water Standard [b/]	Secondary Drinking Water Standard [b/]
Aluminum	0.06 [c/]	0.05	0.05	0.05		0.2
Barium	0.12	0.09	0.00	0.03	2	
Cadmium	0.00	0.00	0.00	0.00	0.005	
Chloride	49.44	37.53	90.28	76.30		300
Chromium	0.00	0.00	0.03	0.02	0.1	
Copper	0.02	0.02	0.03	0.03	1.3	1
Fluoride [d/]	2.68	3.08	4.00	3.63	4	2
Iron	0.01	0.01	0.04	0.03		0.3
Manganese	0.00	0.00	0.03	0.02		0.05
Nickel	0.00	0.00	0.03	0.02	0.1	
Nitrate	0.03	0.02	12.45	8.57	45	
Lead	0.00	0.00	0.00	0.00	0.01	
pH, units	7.70	7.70	5.37	6.10		7
Selenium	0.00	0.00	0.01	0.00	0.05	
Sulfate	69.48	52.14	182.99	145.74	500	300
TDS [e/]	422.64	327.24	776.85	656		500

a/ Source: CH2M Hill, 1998b.
b/ Source: U.S. Environmental Protection Agency, 1997.
c/ All units in milligrams per liter (mg/L) unless otherwise noted.
d/ Shaded constituents indicate irrigation water exceedence of standards.
e/ TDS = total dissolved solids.

- The reclaimed water will be disinfected at the system pump station prior to conveyance to the non-potable water storage reservoir.
- The construction contractor will be required to comply with the City cross-connection ordinance and standards.
- The reclaimed water distribution system will use color-coded (purple) pipe to indicate the presence of non-drinking-quality water.
- Appropriate signage indicating the use of reclaimed water for turf watering, not for drinking, will be posted at all locations where the reclaimed water was used for irrigation.

The same measures would be applied to either Alternative A or B.

3.14 INDIAN TRUST ASSETS

This section is included to address the responsibilities of Reclamation to recognize and fulfill its legal obligations to identify, protect, and conserve the trust resources of federally recognized Indian tribes and tribal members, and to consult with tribes on a government-to-government basis whenever plans or actions affect tribal trust resources, trust assets, or tribal health and safety. Even though there were no issues identified during the scoping activities pertaining to Indian trust resources and assets, this section describes the results of complying with procedures to ensure that Reclamation explicitly addresses and considers possible effects of its activities on Indian trust resources during the planning, decision, and operational phases of proposed project reviews.

3.14.1 Affected Environment

The project area involves only properties that are privately-owned or owned by non-Indian governmental institutions. Governmental institutions include a mixture of federal, state, county, and city organizations. Land to be affected by the physical construction of structural facilities (i.e., storage tanks, pump stations, and water irrigation systems) would occur on property predominantly owned or managed by state, county, and city governments and on lands owned and managed by private businesses.

There are no tracts or blocks of Indian-owned or managed properties in the proposed project construction areas. None of the project facilities associated with any of the alternative alignments would be located on known tribal lands.

There are no known Indian trust resources that occur within the project analysis boundaries. Hunting and fishing resources, mineral rights, lands, vegetation trust assets are assumed to be absent based on prevailing project area land uses.

Existing Rio Grande water rights and instream flows subject to changes from the project would be located upstream of the Isleta Pueblo boundary.

Consultation with the six resident tribes of the Albuquerque area, and the Bureau of Indian Affairs was conducted to confirm the absence of Indian trust resources. Copies of the consultation letters sent to these agencies are shown in Appendix F.

3.14.2 Environmental Consequences

The proposed alignments of both alternatives and the location of proposed structural facilities would not occur on tribal lands, nor would construction affect known Indian trust assets. As is described in the water resources analysis, project operations would alter the existing water supply in the Rio Grande and it would alter the hydrologic regime. However, these changes would be difficult to differentiate from the background variations of existing conditions. The maximum expected change in river flows between the City's wastewater treatment plant outfall and the Isleta Diversion Dam is a reduction in flow of 0.19 percent during the month of October, with an annual average flow reduction of 0.05 percent.

The reduction of influent flow to the treatment plant from the proposed action represents an average annual reduction of only 1.8 percent of the flow through the plant. The loss of this small quantity of water would not adversely affect the quality of the water discharged to the river.

Both action alternatives would create the same conditions and level of change. The primary proposed user of the recycled water is the Balloon Fiesta Park, at the northern margin of the project area and very near to the southern boundary of the Sandia Pueblo. As detailed in Section 3.5, the City will perform periodic sampling of the reclaimed water as defined in the GWDP (CH2M Hill, 1998c) to confirm that the water quality meets NMED application standards and the City's GPPAP. Changes in water application procedures or additional treatment will be made to remain compliant with applicable standards if monitoring indicates potential problems. The City will conduct an ongoing monitoring program to assure that ground water quality in the project area is not affected by the proposed project, per NMED and GPPAP requirements.

The No Action alternative would not affect known Indian trust resources and assets.

As was noted in section 3.14.1, there were no concerns raised at the scoping meetings or during the regulatory agency discussion that suggested this project could potentially affect tribal trust resources, trust assets, or tribal health and safety.

3.14.3 Environmental Commitments

Environmental Design Features

There were no environmental design features or mitigation measures identified or proposed for this project or its alternatives to address Indian trust resource and asset concerns because there were no substantial or major effects to Indian trust resources or assets identified by the effects analysis or public scoping processes.

3.15 AIR QUALITY

The project-related air quality environmental issues identified during scoping activities are listed in Table 3.1-1.

3.15.1 Affected Environment

The Albuquerque area is an attainment area for criteria pollutants regulated under Clean Air Act guidelines. Ambient air emissions in the evaluation area include emissions from cooling towers, cement and gypsum wallboard manufacturers, and automobiles. In addition, the open space areas along the west side of the project area are sparsely covered with vegetation and are subject to wind erosion. Dust emissions occur during windy days from sparsely vegetated open fields and industrial facilities that have unprotected sand and gravel stockpiles.

Airborne particulate matter in the Albuquerque/Bernalillo County area is regulated under the State of New Mexico regulations for Airborne Particulate Matter, Title 20, Chapter 11, Part 20 (20 NMAC 11.20; New Mexico, State of, 1997). Local activity permitting and regulatory efforts by the City of Albuquerque, Department of Environmental Health are based on this guidance.

3.15.2 Environmental Consequences

With the implementation of the environmental design features discussed below, as required by the City for construction projects, no temporary, long-term, or cumulative adverse effects to air quality would be expected for either of the action alternatives.

The following situations would be deemed an unacceptable adverse effect to air quality:

- Emissions from construction equipment or construction of project facilities that would cause an existing state or federal air quality standard to be met or exceeded.
- Emissions that cause violations or degradation of non-attainment air quality parameters.
- Dust or other emissions from the project site that cause air quality conditions to degrade.

Approximately 55 percent of the pipeline corridor for Alternative A and 70 percent of the pipeline corridor for Alternative B would be constructed along streets that are not paved and along arroyos in areas that have minimal ground cover. Dust emissions would be expected to occur during windy days during construction activities

The anticipated effects of the proposed project and its alternatives are summarized in Table 3.15-1. As the summary comparison indicates, there would not be substantial differences in anticipated air quality effects among the alternatives. None of the alternatives would exceed existing air quality standards. Dust emissions would not be expected to incrementally degrade existing conditions. The project would not affect non-attainment criteria because the City is designated as an attainment area.

Construction and installation of pipeline in the community are activities that would occur without substantial effects to air quality in the airshed provided that the standard protective measures stipulated by the City's *Development Process Manual* (Albuquerque, City of, 1997) were met. Protective measures are routinely incorporated into standard construction procedures to minimize emissions of regulated pollutants.

The potential extent of air quality degradation from construction activities would be related to the total length of pipeline to be installed, and the areal size of facilities to be constructed. Larger or longer facilities increase the area of disturbance and the potential for dust emissions. In general, environmental regulations for air quality are directed at minimizing the level of the blown dust or diesel emissions by specifying control practices to be implemented by the construction contractor.

Because the pipeline would be installed at the rate of 400 to 500 feet per day, air quality effects at any locale from the generation of dust and construction equipment emissions would be temporary, lasting only 1 or 2 days. Pipeline routes located in or along existing paved streets would generate substantially lower concentrations of dust that route segments located along unpaved streets or undeveloped open land.

With the implementation of the environmental design features discussed below, as required by the City for construction projects, no temporary, long-term, or cumulative adverse effects to air quality would be expected for either of the action alternatives.

TABLE 3.15-1
SUMMARY OF ANTICIPATED EFFECTS TO AIR QUALITY

Evaluation Criterion	Alternative A	Alternative B	No Action
1. Total length of unpaved route that would be disturbed by construction (linear feet)	23,500	38,500	0

For the No Action alternative, no facilities would be constructed, and none of the temporary construction effects to air quality would take place.

3.15.3 Environmental Commitments

Environmental Design Features

City requirements for construction activities (Albuquerque, City of, 1997) mandate that the kind of construction activities associated with this project must include implementation of the following air quality protection measures. Compliance with these measures is required to obtain City construction permits. Implementation of these design features would ensure that substantial adverse effects to air quality will not result from either of the action alternatives.

- Limit the amount of trench that will be open at any time.
- Ensure that construction equipment, including all diesel engines, meet City opacity standards for operating emissions.
- Conform to the BMPs to minimize particulate and dust emissions from construction work sites that are specified in the City excavation, grading, and surface disturbance permits that are obtained for this project.
- Adhere to any and all requirements placed on the activity, and be subject to inspection by the City to enforce the requirements of the permits and the requirements of 20 NMAC 11.20.

The same design measures would be applied to either Alternative A or B.

3.16 ENVIRONMENTAL JUSTICE

There were no environmental justice issues identified during the scoping activities. This section is included in this EA to address the requirements of Executive Order No. 12898, which provides minority and low-income populations an opportunity to comment on the development and design of Reclamation activities and on the consequences of proposed Reclamation actions. This Executive Order requires that federal agencies shall make achieving environmental justice part of their missions by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations.

3.16.1 Affected Environment

The project area is composed of a mixture of income levels and land use types, none of which are considered to be predominantly minority populations nor low-income populations. Existing land use and neighborhood characteristics along the corridor alignments and at the proposed locations of the storage and distribution tanks are predominantly business, light industrial, and mixed residential land uses. Field investigations of the areas to be affected by installation and construction activities did not reveal or suggest the presence of community characteristics that would be considered disproportionately minority or low-income neighborhoods.

3.16.2 Environmental Consequences

The proposed alignments of both alternatives cross a wide spectrum of community neighborhood types and income levels. The linear and narrow characteristics of the pipeline routes ensures there is no disproportionate concentration of facilities in neighborhoods or community sections that would be considered low-income or predominately minority occupied. The pump station, water storage tank, and water distribution tank would be located in neighborhoods that are considered middle income or they would be associated with areas that are primarily devoted to business and light industrial activities. As was noted in the noise and vibration analysis discussion, project construction effects are anticipated to last no more than 2 days in any particular location along the route alignment. This disruption is considered to be a temporary nuisance. Effects would be similar for both of the build alternatives.

The No Action alternative would not require new construction or operational activities. Therefore, there would be no displacement, relocation, economic, or any other type of disproportionate effect to minority or low-income populations of the community.

Pipeline routing was determined by the location and engineering hydraulics of moving water between the existing storage, water source, and distribution facilities. None of the project construction or operational characteristics would require the displacement or relocation or minority or low-income population members.

As was noted in Section 3.16.1, there were no concerns raised at the scoping meetings or during the regulatory agency discussion that suggested this project could potentially generate disproportionate environmental effects to low–income or minority groups.

3.16.3 Environmental Commitments

There were no environmental commitments or mitigation measures identified or proposed for the proposed project or its alternatives to address environmental justice concerns because there are no anticipated disproportionate high and adverse effects to human health or the environmental conditions of minority or low-income groups.

3.17 CUMULATIVE EFFECTS

Appendix E presents a summary of the planned or ongoing projects in the Rio Grande basin that were considered in the evaluation of the potential cumulative effects of the proposed action. These planned or ongoing projects include the City's WRSI projects, ongoing activities on the

river such as upstream wastewater discharges and agricultural water use, and regulatory agency projects affecting river operations and flow patterns.

If the proposed action is not implemented, all of the other planned or ongoing activities noted in Appendix E will or are expected to occur (the City's proposed North I-25 Non-potable Surface Water Reclamation Project would have to be modified to include some additional plumbing). The potential cumulative effects identified for the proposed action are: 1) the accumulation of 448 ac-ft less stream flow per year, each year that the project is in operation; and, 2) the accumulation of an equivalent volume of ground water saved each year. In the context of basin flows, this cumulative stream flow effect remains insignificant. However, in the context of proposed future City WRSI activities, the effects on stream flow may become significant in the future, and will be addressed as those planned projects and potential effects are defined. Likewise, the volume of ground water saved may not be significant with the implementation of this project, but may become significant in the context of proposed future projects associated with the WRSI. Consultations on the potential cumulative effects of these projects on endangered species and Indian Trust Assets would also be conducted.

There were no adverse cumulative effects identified for the proposed project. The incremental effect of reducing ground water withdrawals by using reclaimed industrial process water is considered a beneficial effect to future water supply sustainability. The cumulative effects of incrementally reducing the ground water withdrawals is considered a beneficial effect to the human environment.

SECTION 4

ENVIRONMENTAL COMMITMENTS

Environmental commitments include design features incorporated into the proposed project that are intended to protect environmental aspects of the project site, and mitigation measures that are intended to eliminate or minimize potentially adverse changes of environmental resources. Environmental commitments are identified in Table 4-1 for each of the resource areas for which issues were raised during project scoping activities.

The project proponent commits to incorporate these features into the project design, and perform these measures as required to minimize effects, as a condition for the implementation of the project.

For most of the resource areas evaluated, the same measures will be applied to either of Alternative A or B, so there would be no substantial differences in measures between the two alternatives. In resource areas where the measures differ between the alternatives, a note is added in the table to indicate to which alternative the measure applies.

TABLE 4-1
ENVIRONMENTAL COMMITMENTS

COMMITMENT IDENTIFICATION	ENVIRONMENTAL COMMITMENT	TYPE OF COMMITMENT
RESOURCE AREA – WATER		
W-01 [a/]	• The reclaimed water will meet agreed-to standards defined in a contract between the source industries and the City.	EDF [b/]
W-02	• The City will perform periodic sampling of reclaimed water as defined in the GWDP (CH2M Hill, 1998d) to confirm that the water quality meets NMED application standards and the City's GPPAP. Changes in water application procedures or additional treatment will be made to remain compliant with applicable standards if monitoring indicated potential problems.	EDF
W-03	• State approval of the GWDP application will be acquired prior to issuing construction permits for the reclaimed water distribution system (GPPAP requirement).	EDF
W-04	• The City will ensure that the reclaimed water quality will meet the appropriate user requirements for industry, turf irrigation, and other uses (Albuquerque, City of, 1998; CH2M Hill, 1998b), on an ongoing basis.	EDF
W-05	• The City will meter all use of the reclaimed water by all users.	EDF

TABLE 4-1 (Continued)
ENVIRONMENTAL COMMITMENTS

COMMITMENT IDENTIFICATION	ENVIRONMENTAL COMMITMENT	TYPE OF COMMITMENT
RESOURCE AREA – WATER (CONTINUED)		
W-06	• The City will conduct an ongoing monitoring program to assure that ground water quality in the project area is not affected by the proposed project, per NMED and GPPAP requirements. The City will use its existing regional ground water monitoring network to perform this monitoring. The monitoring program will be conducted at a frequency and at appropriate locations to allow a complete picture of existing ground water quality and the potential effects of project actions, as required by the GWDP.	EDF
W-07	• The City will create, maintain and update an accounting system that will document the proposed projects' effects on the flow regime of the Rio Grande, and will be updated to include the effects of the City's other planned water reclamation and water supply projects.	
RESOURCE AREA – AESTHETICS AND VISUAL RESOURCES		
AV-01	• Reservoir siting and site preparation will minimize vertical intrusion by incorporating lowered elevation (tank base set below surrounding grade) and blending with site contours.	EDF
AV-02	• Appropriate landscaping and interposed wall structures, consistent with the site access and security, will minimize visual effect.	EDF
AV-03	• Appropriate reservoir and wall structure patterns and coloration will be used to minimize visual intrusion	EDF
AV-04	• Appropriate site access limitations and maintenance activities will be implemented to prevent vandalism and graffiti and to assure continued visual minimization	EDF
RESOURCE AREA – TRAFFIC AND CIRCULATION		
TC-01	• The pipeline will be routed in existing utility rights-of-way to minimize length and potential interference with traffic.	EDF
TC-02	• The pipeline installation will be bored under major intersection crossings to minimize traffic disruption.	EDF
TC-03	• The construction contractor will meet City requirements for preparing an impedance analysis and traffic/barricade plan, and will implement appropriate work measures as needed to insure an adequate level of service on affected streets (i.e., flexible work site scheduling, extended work hours, weekend vs. weekday construction, and non-peak hour construction).	EDF
RESOURCE AREA – BIOLOGICAL RESOURCES		
BR-01	• Project pipeline alignments have been routed primarily in developed public rights-of-way to minimize activity in undisturbed areas.	EDF

TABLE 4-1 (Continued)
ENVIRONMENTAL COMMITMENTS

COMMITMENT IDENTIFICATION	ENVIRONMENTAL COMMITMENT	TYPE OF COMMITMENT
RESOURCE AREA – BIOLOGICAL RESOURCES (CONTINUED)		
BR-02	• The City of Albuquerque will create winter habitat structures in the river of a design and configuration thought to be effective in providing effective habitat for winter survival of the Rio Grande silvery minnow (USFWS, 1998). The final design and configuration of the structures will be developed in conjunction with the USFWS. Structures will be in place in November 1999. Monitoring of Rio Grande silvery minnow abundance associated with these structures will be conducted over a three-month period during the winters of 1999-2000 and 2000-2001, at a frequency and methodology to be developed with the USFWS.	MM
RESOURCE AREA – SOILS AND VEGETATION		
SV-01	• Guidance from the City regarding irrigation management will be provided to all reclaimed water users.	EDF
SV-02	• As part of the irrigation water supply contract the City signed with users, the City will monitor monthly the metered use of reclaimed water versus user acreage, focusing on indications of too little use of water (potential topsoil salt accumulation from inadequate leaching) or too much use (resulting in potentially flushing the salts down into the ground water).	EDF
SV-03	• The City will require monthly irrigation management reports from the City Parks and General Services Department, other City users, and all private users, indicating area watered and amount of reclaimed irrigation water applied.	EDF
RESOURCE AREA – CULTURAL RESOURCES		
CR-01	• A pedestrian survey and cultural resources documentation will be conducted prior to construction in those sections of the proposed project area that exhibited undisturbed ground surface. An undisturbed ground surface is defined as a landscape surface without extensive human-caused modification. Any cultural resources found during this survey will be documented and evaluated as to their national Register eligibility. Reclamation will consult with SHPO regarding the eligibility of these sites. The inventory phase of the project will also identify specific MRGCD facilities that will be affected by the project. Any eligible sites or portions of the irrigation system will either be avoided by realigning the project, or a data recovery plan approved by Reclamation and SHPO will be implemented to mitigate the adverse effects of the project on the sites.	EDF

TABLE 4-1 (Continued)
ENVIRONMENTAL COMMITMENTS

COMMITMENT IDENTIFICATION	ENVIRONMENTAL COMMITMENT	TYPE OF COMMITMENT
RESOURCE AREA – CULTURAL RESOURCES (CONTINUED)		
CR-02	• Before ground disturbing construction work takes place a meeting will be arranged to inform construction crews of the potential for disturbing subsurface cultural resources and of procedures involved in the event that this occurs. This is especially important with regard to exhuming human remains.	EDF
CR-03	• A cultural resources discovery plan will be prepared and finalized through consultation with the Reclamation and the SHPO, prior to the beginning of construction. The plan will outline procedures for protecting newly discovered cultural resources, evaluating their importance, and avoiding or mitigating the project's adverse effects to them. The plan will also detail procedures for complying with the Native American Graves Protection and Repatriation Act (NAGPRA), in case human remains are discovered.	EDF
CR-04	• In addition to avoidance and data recovery, precautions will be taken to make sure archaeological assistance is immediately available in case of a discovery. The discovery plan approved by Reclamation and SHPO will outline these precautions in detail. Work at the site will cease if cultural resources were unearthed during construction activities in these areas. The archaeologist will respond to a telephone call from the site to evaluate the unearthed materials and insure that any uncovered cultural resources were appropriately recorded or avoided, based on the discovery plan referenced above. Work at the site will resume after such recording or avoidance was completed.	MM
RESOURCE AREA – SOCIOECONOMIC FACTORS		
SE-01	• Facility plans and specifications developed for the project will be designed to minimize project costs while meeting all of the project objectives.	EDF
RESOURCE AREA – NOISE AND VIBRATION		
NV-01	• The construction contractor will be responsible for meeting the noise ordinance requirements of the City (ACC § 6-22) for noise control on construction equipment.	EDF
NV-02	• The contractor will adhere to project work hour restrictions (work allowed only between 7am to 10pm) within 500 feet of residences, hospitals, schools, churches, and libraries.	EDF
NV-03	• The contractor will arrange the construction schedule to restrict the number of days in one work location within 500 feet of the same residence, hospital, school, church, or library to four days.	EDF

TABLE 4-1 (Continued)
ENVIRONMENTAL COMMITMENTS

COMMITMENT IDENTIFICATION	ENVIRONMENTAL COMMITMENT	TYPE OF COMMITMENT
RESOURCE AREA – HUMAN HEALTH AND SAFETY		
HH-01	• The recycled water will be disinfected at the system pump stations prior to distribution.	EDF
HH-02	• The construction contractor will comply with the requirements of the City cross-connection ordinance and standards.	EDF
HH-03	• The recycled water distribution system will use color-coded pipe to indicate the presence of non-drinking quality water.	EDF
HH-04	• Appropriate signage indicating the use of recycled water for turf watering, not for drinking, will be posted at all locations where the recycled water is used for irrigation.	EDF
RESOURCE AREA – INDIAN TRUST ASSETS		
	• No commitment measures necessary.	
RESOURCE AREA – AIR QUALITY		
AQ-01	• Construction requirements such as restrictions on the amount of trench that may be open at any one time are described in the City's general specifications for public works.	EDF
AQ-02	• The construction contractor will be responsible for assuring that construction equipment meets City opacity standards for operating emissions (especially for diesel equipment).	EDF
AQ-03	• The construction contractor will acquire excavation, grading, and surface disturbance permits that specify BMPs to minimize particulate and dust emissions from construction work sites.	EDF
AQ-04	• The construction contractor will adhere to any other requirements placed on the activity, and be subject to inspection by the City to enforce the requirements of the permits and the requirements of 20 NMAC 11.20.	EDF
RESOURCE AREA – ENVIRONMENTAL JUSTICE		
	• No commitment measures necessary.	
RESOURCE AREA – PUBLIC INFORMATION		
PI-01	• The City will publicize WRSI projects via the media (i.e. the City's internet web page, videos, news releases, meetings with stakeholders, Customer Advisory Committee meetings, and City Council meetings) as these projects go forward.	EDF

[a/] Resource Area abbreviations:

AV	aesthetics/visual resources	HH	human health and safety	SV	soils and vegetation
AQ	air quality	NV	noise and vibration	TC	traffic and circulation
BR	biological resources	PI	public information	W	water
CR	cultural resources	SE	socioeconomic factors		

[b/]

BMPs	best management practices	EDF	environmental design feature	MM	mitigation measure

SECTION 5

CONSULTATION AND COORDINATION

5.1 CONTACTS WITH AGENCY PERSONNEL

The following persons were contacted regarding the environmental analyses prepared for this Environmental Assessment:

Clarence Chavez, Soils Survey Scientist
Natural Resources Conservation Service
Albuquerque, New Mexico
(505) 761-4435
Soils information in recycled water project area
August 1998

Marcy Leavitt
New Mexico Environment Department, Groundwater Bureau
Santa Fe, New Mexico
(505) 827-2906
Groundwater discharge permit requirements
June 1998

Eric Peterson, Staff Archaeologist
New Mexico State Historic Preservation Office
Santa Fe, New Mexico
(505) 827-4064
Information on documented cultural resources sites in the project area
September 1998

Charles McDonald, Ph.D., Botanist
U.S. Fish & Wildlife Service
New Mexico Ecological Services Office
Albuquerque, New Mexico
(505) 761-4525
Information on federally-listed species in Bernalillo County
September 1998

The following pueblos and agencies were contacted regarding the environmental analyses for Indian Trust Assets prepared for this Environmental Assessment:

Cochiti Pueblo
Cochiti, New Mexico

Pueblo of Isleta
Isleta, New Mexico

San Felipe Pueblo
San Felipe Pueblo, New Mexico

Pueblo of Santa Ana
Bernalillo, New Mexico

Pueblo of Santo Domingo
Santo Domingo, New Mexico

Pueblo of Sandia
Bernalillo, New Mexico

Bureau of Indian Affairs, Southern Pueblos Agency
Albuquerque, New Mexico

Bureau of Indian Affairs, Albuquerque Area Office
Albuquerque, New Mexico

Copies of the consultation letters sent to these agencies are in Appendix F.

The following persons and agencies were contacted regarding the endangered species consultation for this Environmental Assessment:

Jennifer Fowler-Propst, State Supervisor
U.S. Department of Interior, Fish & Wildlife Service
New Mexico Ecological Services State Office
2105 Osuna Road NE
Albuquerque, New Mexico 87113
(505) 346-2525

A copy of the consultation letter sent to this agency is in Appendix G.

5.2 RESOURCE ISSUES IDENTIFIED DURING SCOPING

The following areas were identified in the scoping meetings with the project sponsor, the lead Federal agency (Reclamation), and the public as potential areas of environmental controversy:

- Water
- Aesthetics/visual resources
- Traffic and circulation
- Biological resources
- Soils and vegetation
- Cultural resources
- Socioeconomic factors
- Noise and vibration
- Human health and safety
- Indian trust assets
- Air quality
- Environmental justice

Each of these areas has been fully addressed in the "Affected Environment and Environmental Consequences" section of this Environmental Assessment. A summary of scoping comments received is presented in Appendix B.

5.3 FORMAL RECOMMENDATIONS BY AGENCIES OR ORGANIZATIONS

No formal recommendations by agencies or organizations were received, other than those comments received at the scoping meeting held for the project.

5.4 NOTIFICATION

5.4.1 Newspaper and Other Notifications

Notification announcements regarding the public scoping meeting for this Environmental Assessment were placed in the following local newspapers:

- Friday, September 11, 1998 Albuquerque Journal
  (display advertisement)
- Sunday, September 13, 1998 Albuquerque Journal
  (reaches combined readership of Journal and Tribune)
- Sunday, September 20, 1998 Albuquerque Journal
  (reaches combined readership of Journal and Tribune)
- Tuesday, September 22, 1998 Albuquerque Tribune and Albuquerque Journal
  (in the "Outlook" section)

A notice was placed in the City-sponsored *Neighborhood News*, which is distributed to neighborhood association presidents and officeholders throughout the City.

Notification using mailer cards was sent to stakeholders and residents living within one mile of the project area. A total of more than 900 mailer cards were sent out.

5.4.2 Scoping Meetings

Scoping meetings were held for the project as follows:

Agency Coordination

This meeting was held Friday, August 14, 1998; at 10am at Reclamation offices in Albuquerque. Attendees included L. Robertson (Reclamation), S. Larralde (Reclamation), J. Stomp (City of Albuquerque), D. Connally (Parsons Engineering Science), L. Young (Parsons Engineering Science).

A listing of the issues identified at the meeting is included in Appendix B.

Public Scoping Meeting

This meeting was held on Wednesday, September 23, 1998, from 6:30 to 8:30pm at the Alameda Community Center, 9800 4th Street NW, in Albuquerque.

A listing of the issues identified at the meeting is included in Appendix B.

5.5 PUBLIC INFORMATION

The City maintains an active Public Information program to keep the public informed regarding planning and implementation of capital works projects. The City will publicize information regarding the WRSI projects as they go forward. The types of media that will be used to inform the public will include the City's website, videos, news releases, meetings with stakeholders, Customers Advisory Committee meetings, and City Council meetings.

5.6 DISTRIBUTION LISTS

List of those to whom the Draft Environmental Assessment was mailed are included in Appendix C. Separate lists are presented for names developed by the project sponsor and for those persons who requested a copy of the Draft EA based on project announcements or attendance at the scoping meeting.

SECTION 6

REFERENCES

6.1 REFERENCES CITED

Albuquerque, City of, 1981. Albuquerque City Code, §6-22. Article 9: Noise control. Chapter 9: Health, Safety and Sanitation. Original Ordinance 1974. Amended Ordinance 30-1981.

Albuquerque, City of, 1997. Development Process Manual: Planning Department, Public Works Department (as amended). July.

Albuquerque, City of, and Bernalillo County, 1995. Groundwater Protection Policy and Action Plan. Adopted by the Board of County Commissioners, November 1993, and the Albuquerque City Council, August 1994. Printed January 1995.

Albuquerque, City of, 1998. Balloon Fiesta Park Master Development Plan (Draft). February.

California Code of Regulations (CCR), 1995. Title 22 (Division 4, Chapter 15, Article 16, §64449: Secondary maximum contaminant levels and compliance). Revised 23 June 1995.

CH2M Hill, 1996. Water Reuse System. Prepared for Philips Semiconductors, Albuquerque, New Mexico. December.

CH2M Hill, 1997a. City of Albuquerque Water Resources Management Strategy – Evaluation of Alternatives and Strategy Formulation: Summary Report. Prepared for City of Albuquerque, Public Works Department. March.

CH2M Hill, 1997b. City of Albuquerque Water Resources Management Strategy – Preliminary Evaluation of Environmental Consequences. Prepared for City of Albuquerque, Public Works Department. March.

CH2M Hill, 1997c. City of Albuquerque Water Resources Management Strategy – Evaluation of Alternatives and Strategy Formulation: Technical Basis of the Recommended Strategy. Prepared for City of Albuquerque, Public Works Department. March.

CH2M Hill, 1997d. City of Albuquerque Water Resources Management Strategy – Evaluation of Alternatives and Strategy Formulation: Executive Summary. Prepared for City of Albuquerque, Public Works Department. February.

CH2M Hill, 1998a. North I-25 Corridor Non-potable Water System. Prepared for Philips Semiconductors, Albuquerque, New Mexico. January.

CH2M Hill, 1998b. Memorandum on Information Request from Parsons Engineering Science regarding North I-25 Water Recycling Project, Phase 1. NEPA Document Database ID #092898-3. September 24, 1998.

CH2M Hill, 1998c. City of Albuquerque North I-25 Reuse Corridor, Groundwater Discharge Plan Permit Application. Prepared for City of Albuquerque, Public Works Department. May.

CH2M Hill, 1999. Industrial Recycling Project Feasibility Study. Prepared for City of Albuquerque, Public Works Department. February.

Dirr, M.S. 1990. *Manual of Woody Landscape Plants, Their Identification, Ornamental Characteristics, Culture, Propagation, and Uses.* Stipes Publishing Company, Champaign, Illinois.

Ecosystem Management, Inc. (EMI), 1998a. Biological Resources Report: Phase 1, North I-25 Non-potable Water System Project, City of Albuquerque, Bernalillo County, New Mexico. EMI Project Number LH-52-02. October.

Ecosystem Management, Inc. (EMI), 1998b. Cultural Resources Report: Phase 1, North I-25 Non-potable Water System Project, City of Albuquerque, Bernalillo County, New Mexico. EMI Project Number LH-52-02. October.

Gough, L. P., H.T. Shacklette, and A.A. Case. 1979. *Element Concentrations Toxic to Plants, Animals, and Man*. U.S. Geological Survey Bulletin 1466. U.S. Government Printing Office, Washington, D.C.

Hacker, L.W. 1977. *Soil Survey of Bernalillo County and Parts of Sandoval and Valencia Counties, New Mexico.* U.S. Department of Agriculture, Soil Conservation Service and Forest Service, and U.S. Department of the Interior, Bureau of Indian Affairs and Bureau of Land Management, prepared in cooperation with the New Mexico Agriculture Experiment Station.

McKee, J.E. and H.W. Wolf. 1963. *Water Quality Criteria*. California State Water Resources Control Board. Publication No. 3-A. Sacramento, California.

National Soil Survey Laboratory. 1998. Data from Internet site www.statlab. iastate.edu/soils/. Accessed October 1998. University of Nebraska, Lincoln, Nebraska.

New Mexico Forestry and Resources Conservation Division (NMFRCD), 1995. Inventory of the Rare and Endangered Plants of New Mexico. Edited by R. Sivinski and K. Lightfoot. NMFRCD Miscellaneous Publication No. 4: Third Edition. August.

New Mexico, State of, 1997. Ground and Surface Water Quality Protection Regulations Title 20, Chapter 6, Part 2 (20 NMAC 6.2), as amended.

New Mexico, State of. 1996. *Regulations for Airborne Particulate Matter.* Title 20, Chapter 11, Part 20 (20 NMAC 11.20). Albuquerque, New Mexico.

Reclamation, Bureau of, 1990. National Environmental Policy Act Handbook. U.S. Department of Interior, Bureau of Reclamation. Denver, Colorado. October.

Reclamation, Bureau of, 1998. Guidelines for Preparing, Reviewing, and Processing Water Reclamation and Reuse Proposals under Title XVI of Public Law 102-575, as amended. Draft.

Salinity Laboratory Staff. 1954. *Diagnosis and Improvement of Saline and Alkali Soils*. Agriculture Handbook No. 60. L.A. Richards (ed.). U.S. Department of Agriculture. U.S. Government Printing Office, Washington, D.C.

SHPO. 1999. Guidelines for Acequia Recording During Cultural Resource Surveys. SHPO Note Number 5. January.

SWCA, Inc. 1997. The Development of Irrigation Systems in the Middle Rio Grande Conservancy District, Central New Mexico: A Historic Overview. Prepared for Albuquerque Area Office, Bureau of Reclamation. Prepared by SWCA, Inc. Albuquerque, New Mexico.

United States Golf Association, *et al*., 1994. Wastewater Reuse for Golf Course Irrigation. Lewis.

U.S. Environmental Protection Agency. 1972. *Water Quality Criteria*. Section V - Agriculture uses of water. A Report of the Committee on Water Quality Criteria, Environmental Studies Board. Washington, D.C.

U.S. Environmental Protection Agency (EPA), 1992. Guidelines for Water Reuse. EPA/625/R-92/004. September.

U.S. Environmental Protection Agency (EPA), 1997. Primary and Secondary National Drinking Water Regulations. 40 CFR Part 141 (Primary) ands Part 143 (Secondary). Revised 1 July 1997.

U.S. Fish & Wildlife Service (USFWS), 1998. Draft Rio Grande silvery minnow (*Hybognathus amarus*) Recovery Plan. Region 2, U.S. Fish & Wildlife Service. September.

U.S. Fish and Wildlife Service (USFWS). 1999. Draft Environmental Assessment – Designation of Critical Habitat for the Rio Grande silvery minnow. Prepared by U.S. Fish and Wildlife Service, Albuquerque, New Mexico. Undated.

U.S. Geological Survey (USGS), 1995. Simulation of flow in the Albuquerque groundwater basin, central New Mexico, 1901-1994, with projections to 2020. Prepared in cooperation with the City of Albuquerque Public Works Department.

6.2 OTHER SOURCES OF INFORMATION

The following persons were contacted regarding the environmental analyses prepared for this Environmental Assessment:

City of Albuquerque
Public Works Department
Transportation Division
Tony Lloyd, Traffic Impact Studies
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Traffic impact analysis
9/21/98

City of Albuquerque
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Surface disturbance permitting; dust control
9/23/98

City of Albuquerque
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Permits Division
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Traffic impact analysis
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City of Albuquerque
Environmental Health Department
Richard Mitzelfelt, Manager,
Consumer Protection Division
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Noise analyses and control
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SECTION 7

LIST OF PREPARERS

Table 7-1 lists the persons involved in preparing the Environmental Assessment for the North I-25 Industrial Recycling Project.

TABLE 7-1
PREPARERS OF THE ENVIRONMENTAL ASSESSMENT

Name	Degree and/or Certification	Project Role	Years Experience	Background
Department of Interior, Bureau of Reclamation (Lead Federal Agency)				
Lori Robertson	M.A., Biology	Environmental Protection Specialist	14	Aquatic biology, environmental compliance
Signa Larralde	Ph.D., Anthropology	Archaeologist	23	Archaeology of the intermountain West, cultural resources compliance
City of Albuquerque, Public Works Department				
John Stomp	M.S., Civil Engineering; P.E.	Manager, Water Resources Division	10	Water resources, water and wastewater systems
Mark Schmidt	M.S., Civil Engineering; P.E.	Recycled Water Projects, Water Resources Division	10	Water resources, groundwater remediation
Parsons Engineering Science, Inc. (NEPA Documentation Consultant)				
Robert C. Viramontes	M.S., Engineering and Environmental Management; P.E.	Project Manager	12	Groundwater remediation, environmental compliance
David Connally	M.S., Oceanography; R.E.A.	NEPA Compliance Manager	21	Water resources and water quality management
Bruce Snyder	M.S. Wildlife Biology; C.W.B.	Technical Manager	29	Wildlife, wetlands, endangered species, impact analysis methods
Larry Young	M.S., Range Management	Sr. Environmental Scientist	31	Soils, geology, vegetation, range management
Jan Snyder	B.S., Zoology	Technical Editor	24	Biology, technical editing
Patty Phillips	M.S., Plant Ecology	Technical Support	1	Wildlife biology, Ecology
Heidi Engleking	B.A., Music	Database Management	12	Office administration

TABLE 7.1 (CONTINUED)
PREPARERS OF THE ENVIRONMENTAL ASSESSMENT

Name	Degree and/or Certification	Project Role	Years Experience	Background
Ecosystem Management, Inc. (Biological and Cultural Resources Consultant)				
William Hevron	M.A., Biology-Botany	Biologist	12	Endangered species, riparian vegetation, wetlands
Karen Kramer	Ph.D., Anthropology	Cultural resources	10	Cultural and historical resources
CH2M Hill (Engineering Design Consultant)				
Michael Bitner	M.S., Geology; R.G.	WRSI Program Manager	17	Water resources planning and management
Joseph Chwirka	M.S. Civil Engineering; P.E.	WRSI Project Manager	20	Water and wastewater civil engineering
Michael Brewer	M.S. Civil Engineering	Project Engineer	17	Water and wastewater civil engineering
Information Illustrated				
Jan Underwood	B.S., Cartography	Graphic Design	13	Environmental science cartography and graphic information

B.A. Bachelor of Arts
B.S. Bachelor of Science
C.W.B. Certified Wildlife Biologist
M.A. Master of Arts
M.S. Master of Science
NEPA National Environmental Policy Act
P.E. Professional Engineer
Ph.D. Doctor of Philosophy
R.E.A. Registered Environmental Assessor
R.G. Registered Geologist
WRSI Water Resources Strategy Implementation
-- none

APPENDIX A
APPLICABLE LAWS AND REGULATIONS

The stated purpose of the proposed project is consistent with Reclamation goals to optimize water uses in areas where Reclamation is a principal water resources manager. A feasibility study (CH2M Hill, 1998b) was prepared for the project to meet the requirements of Reclamation's *Guidelines for Preparing, Reviewing, and Processing Water Reclamation and Reuse Proposals under Title XVI of Public Law 102-575,* as amended (Bureau of Reclamation, 1998). The proposed implementation of the project must also meet the requirements of NEPA and the National Historic Preservation Act (NHPA). This EA addresses part of those requirements.

The State of New Mexico has developed ground water discharge limitations to protect the quality of the ground water in the state (New Mexico, State of, 1997) to protect the existing ground water quality from degradation from the discharge of liquids or solids to the environment. These regulations relate to the quality of the water in the ground, not the quality of applied or discharged water. Water that has concentrations of regulated constituents greater than those listed in the regulations can be discharged, as long as the local ground water constituent concentrations remain less than the standards.

Reclaimed industrial wastewater that is land-applied for irrigation cannot be allowed to contaminate the local ground water quality. A GWDP must be submitted to the NMED describing the quality of the water to be applied, BMPs to be implemented, and the quality of ground waters in the project area. This plan supports an application to NMED for a GWDP. The City's *GWDP Permit Application* (CH2M Hill, 1998d) to the NMED includes such a plan in support of an application for a ground water discharge permit.

The City adopted the GPPAP to protect the ground water resources within the City service area and Bernalillo County at or above the drinking water standards (Albuquerque, City of, and Bernalillo County, 1995). Threats to the ground water were identified, and agricultural practices were indicated as a low-priority threat related to pesticides, herbicides, fertilizers, and irrigation water. The use of reclaimed industrial wastewater may be considered as a similarly low threat. The GPPAP identified action levels at which appropriate actions, such as increased frequency of ground water quality monitoring, will be taken to prevent ground water constituent concentrations from exceeding 50 percent of the primary drinking water standards and 100 percent of the secondary drinking water standards (U.S. Environmental Protection Agency, 1997).

A listing of the required federal, state, and local permits for the proposed project is presented in Table A-1. This listing also identifies the entity that is responsible for obtaining each permit.

TABLE A-1
PROJECT PERMITS REQUIRED [a/]

SOURCE	PERMIT	ACQUISITION RESPONSIBILITY
Federal		
None		
State		
New Mexico Environment Department and Water Quality Control Commission	Ground Water Discharge Plan	City of Albuquerque
New Mexico Department of Transportation	Permit to bore under I-25	City of Albuquerque
Local		
City of Albuquerque	Lane closure/barricade	Construction contractor
City of Albuquerque	Excavation	Construction contractor
City of Albuquerque	Grading	Construction contractor
City of Albuquerque	Surface disturbance	Construction contractor

a/ Sources: Albuquerque, City of, 1997; CH2M Hill, 1998b.

APPENDIX B
SCOPING SUMMARY

The City of Albuquerque, Department of Public Works, detailed environmental issues related to the proposed action in a fax dated August 14, 1998, (Document ID 0188) addressing the following resource areas:

- Aesthetics and Visual Resources
- Air Quality
- Cultural Resources (Archaeological)
- Noise and Vibration
- Traffic and Circulation
- Water

In a meeting held on August 14, 1998, the Bureau of Reclamation identified the following resource areas to be addressed in the EA (Document ID 0180):

- Aesthetics and Visual Resources
- Biological Resources (threatened/endangered wildlife)
- Cultural Resources (Archaeological)
- Socioeconomic Factors
- Traffic and Circulation
- Water

A Public Scoping Meeting was held on September 23, 1998, and the following resource areas were identified as areas to be addressed in the EA (Document ID 0286):

- Aesthetics and Visual Resources
- Geology and Soils
- Human Health and Safety
- Water

No other written comments were received regarding potential issues to be addressed in the environmental documentation for the proposed project.

APPENDIX C
DISTRIBUTION OF THE DRAFT ENVIRONMENTAL ASSESSMENT

The distribution list for the Draft Environmental Assessment is presented in this appendix.

No person or organization requested copies of the Draft EA by letter or telephone as a result of scoping meetings or announcements.

CITY OF ALBUQUERQUE
WATER RESOURCES STRATEGY IMPLEMENTATION

Distribution List for Environmental Assessment-
North I-25 Industrial Recycling Project

Albuquerque Metropolitan Arroyo
Flood Control Authority
2600 Prospect NE
Albuquerque, NM 87107
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Interim Executive Director

Bernalillo County Environmental Health
Dept.
Director
600 2nd NW, Suite 400
Albuquerque, NM 87102
Attention: Mr. Richard Brusuelas

Bureau of Indian Affairs
P.O. Box 26567
Albuquerque NM 87125-6567
Attention: Mr. Rob Baracker,
Area Manager

Bureau of Indian Affairs
Albuquerque Area, Regional Water Rights
Plaza Maya Bldg.
615 First Street, Suite 301
Albuquerque, NM 87102
Attention: Mr. Art Martinez

Bureau of Indian Affairs
Southern Pueblos Agency
PO Box 1667
Albuquerque NM 87103
Attention: Mr. Jim Vallie

City of Albuquerque
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Attention: Ms. Sarah Kotchian

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Attention: Mr. Pleas Glenn

City of Albuquerque
Environmental Planning Commission
City Planning Department
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Albuquerque, NM 87103
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Attention: Governor Isaac Herrera

Cochiti Pueblo
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Cochiti Pueblo Wildlife Conservation
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Middle Rio Grande Conservancy District
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Washington, D.C. 20006

New Mexico Audubon Council
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New Mexico Environment Department
Ground Water Quality Bureau
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Santa Fe, NM 87502

CITY OF ALBUQUERQUE
WATER RESOURCES STRATEGY IMPLEMENTATION

Distribution List for Environmental Assessment-
North I-25 Industrial Recycling Project

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CITY OF ALBUQUERQUE
WATER RESOURCES STRATEGY IMPLEMENTATION

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WATER RESOURCES STRATEGY IMPLEMENTATION

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WATER RESOURCES STRATEGY IMPLEMENTATION

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APPENDIX D
ENVIRONMENTAL CRITERIA RESULTING IN ZERO QUANTITIES USED IN THE EFFECT EVALUATION

ENVIRONMENTAL EFFECT	ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE No Action
Water			
a. Number of existing surface water and ground water uses that would be impaired by using reclaimed wastewater.	0	0	0
Aesthetics and Visual Resources			
a. Approximate percent of tank perimeter within 10 feet of ground's surface that would not be screened by vegetation or barrier treatments.	0	0	0
b. Approximate percent of tank perimeter within 10 feet of ground's surface that would allow unrestricted access and potential for vandalism.	0	0	0
c. Number of facilities that would be visually dominant to the average viewer.	0	0	0
d. Number of facilities that would be located in a sensitive viewshed or viewing area.	0	0	0
e. Number of facilities that would have the visual aspects that would consistently draw the eye from the surroundings.	0	0	0
Traffic and Circulation			
a. Number of street segments where anticipated traffic delays would exceed City requirements.	0	0	0
Biological Resources			
a. Total number of federal-listed species that are adversely affected.	0	0	0
b. Total number of state-listed species that are adversely affected.	0	0	0
c. Total number of designated critical habitat areas that are adversely affected.	0	0	0
d. Total acres of designated critical habitat degraded or lost.	0	0	0
e. Total number of wetland areas adversely affected.	0	0	0
f. Total acres of wetlands area loss.	0	0	0
g. Total number of riparian areas adversely affected.	0	0	0
h. Total acres of riparian area loss.	0	0	0

APPENDIX D (continued)
ENVIRONMENTAL CRITERIA RESULTING IN ZERO QUANTITIES USED IN THE EFFECT EVALUATION

ENVIRONMENTAL EFFECT	ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE No Action
Soils and Vegetation			
a. Water quality parameters in irrigation water that would have an adverse effect on plant growth.	0	0	0
b. Acres of land that would not be suitable for irrigation.	0	0	0
c. Number of plant species that would experience toxic effects resulting from irrigation with the reclaimed water.	0	0	0
Cultural Resources			
a. Number of listed cultural resources sites likely to be effected by construction activities.	0	0	0
Socioeconomic Factors			
a. Number of areas that require a change in existing land use(s) or zoning.	0	0	0
b. Number of acres that require a change in existing land use(s) or zoning.	0	0	0
c. Number of businesses or commercial operations along pipeline route that will require relocation or closing?	0	0	0
d. Total number of new jobs (permanent) created by project.	0	0	0
e. Total number of new temporary or seasonal jobs created by project.	0	0	0
f. Amount of rate increase as a percentage of the average household water bill that exceeds 10 percent.	0	0	0
g. Amount of rate increase as a percentage of the average household income that exceeds 1 percent.	0	0	0
Noise and Vibration			
a. Number of expected exceedences of City noise standard.	0	0	0
b. Number of expected exceedences of City vibration standard.	0	0	0

APPENDIX D (continued)
ENVIRONMENTAL CRITERIA RESULTING IN ZERO QUANTITIES USED IN THE EFFECT EVALUATION

ENVIRONMENTAL EFFECT	ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE No Action
Human Health and Safety			
a. The number of cross-connections likely to be implemented during construction activities.	0	0	0
b. The number of recycled water quality parameters that exceed primary drinking water quality standards.	0	0	0
Air Quality			
a. Number of state air quality parameters likely to be exceeded by construction activities.	0	0	0
b. Number of federal air quality parameters likely to be exceeded by construction activities.	0	0	0
c. Number of air quality parameters that will likely exceed non-attainment thresholds	0	0	0

APPENDIX E
CUMULATIVE EFFECTS ANALYSIS

Table E-1 summarizes the planned or ongoing projects in the Rio Grande basin that were considered in the evaluation of the potential cumulative effects of the proposed action. Table E-2 summarizes the potential cumulative effects of planned and ongoing projects in the Rio Grande Basin on the environmental resources evaluated in this Environmental Assessment.

Table E-1
Cumulative Effects Analysis -
Summary of Planned or Ongoing Projects in the Rio Grande Basin

Project	Description
1. City of Albuquerque - North I-25 Industrial Recycling Project (proposed action)	• This project is a component of the City's Water Resources Strategy Implementation (WRSI), proposed for implementation in 1999. The Water Resources Strategy is a series of non-structural and engineering projects designed to implement a sustainable pattern of water supply and use for customers served by the City. The City currently relies solely on ground water for its drinking water and other water supply needs. Recent studies indicate that the use rate of the aquifer underlying the City greatly exceeds the rate of natural recharge, and continued long-term mining of this aquifer will lead to catastrophic ground subsidence and attendant damage to infrastructure in the City, as well as rendering the aquifer body unable to store adequate quantities of ground water to support future use. The purpose of the WRSI projects is to reduce the use of this ground water and implement a sustainable water supply use pattern and a drought reserve against future needs in times of shortage. An early successful component of the WRSI is an ongoing water conservation program, designed to reduce per capita use throughout the City. Subsequent projects include local water reclamation projects to reuse non-potable water supplies for non-drinking uses, and accessing surface water supplies for drinking water. The proposed action is the first step in the implementation of the engineering projects designed to reduce ground water use and implement a sustainable water supply use pattern. The proposed action is fully described and evaluated in this Environmental Assessment. Treated effluent from local industrial processes will be used for turf irrigation and other uses that do not require drinking-quality water. The expected volume of effluent available from these industrial sources is approximately 1 million gallons per day (mgd). This water will replace the use of ground water currently pumped for these activities. Ground water use for activities not requiring drinking-quality water will be reduced. As a result of not pumping this groundwater, infiltration into the aquifer from the Rio Grande will be reduced. The use of this effluent for turf irrigation will slightly decrease the return flow of water from the wastewater treatment plant to the Rio Grande. The expected annual average reduction in ground water use for these activities, as a result of the proposed action, is 448 acre-feet per year. The expected annual average reduction in return flows to the river, as a result of the proposed action, is approximately equivalent to the savings in ground water not pumped.

Table E-1 (continued)
Cumulative Effects Analysis -
Summary of Planned or Ongoing Projects in the Rio Grande Basin

Project	Description
2. City of Albuquerque - North I-25 Non-potable Surface Water Reclamation Project and Southside Municipal Recycling Project (planned)	• These projects are a component of the City's WRSI, proposed for implementation in 2000. In the North I-25 area, non-drinking quality San Juan/Chama water will be diverted from the Rio Grande and used for turf irrigation in northeast Albuquerque. A small infiltration gallery will be constructed alongside the Rio Grande in the area of Alameda Boulevard to take water directly from the river. The capacity of the infiltration gallery will be approximately 13 mgd; the annual average withdrawal from the river, adjusted for seasonal demands, is expected to be approximately 2 mgd (2,200 acre-feet per year). The performance of the infiltration gallery will be monitored to determine the suitability of this technology as a diversion option for the larger Drinking Water Supply Project (see below), as well as to determine the localized effects on surface and ground water quantity and quality, effects on the bosque, and effects on MRGCD facilities. Water from this project will be blended with water from the proposed action and used for turf irrigation and some industrial process uses. The Southside project will further polish treated effluent from the City's wastewater treatment plant for use in local turf irrigation. The project's environmental effects are expected to be similar to those of the proposed action. These projects are designed to reduce the use of ground water for turf irrigation, similar to the purpose of the proposed action. The expected annual average reduction in ground water use for these activities as a result of these projects is approximately 3,000 acre-feet per year.
3. City of Albuquerque - Drinking Water Supply Project (planned)	• This project is a component of the City's WRSI, proposed for implementation in 2005. Surface water from the City's San Juan/Chama supplies will be diverted, treated, and distributed to the City's customers. Infrastructure required includes a water diversion, water treatment plant, and distribution facilities to move the water into the City's existing distribution system. The project may include an aquifer storage and recovery component, whereby treated San Juan/Chama water is stored in aquifers under the City during times of surplus to replenish ground water pumped from the aquifers in the past, and used in the future when supplies from the river are less than the demand. The City expects to fully utilize its San Juan/Chama allotment (approximately 47,000 acre-feet per year) through this project. Negative effects on surface water quantity could result from the Drinking Water Supply Project due to the 47,000 ac-ft. of San Juan/Chama water ceasing to supplement surface water flows with groundwater.
4. City of Albuquerque – Actions to address water quality in the Rio Grande below Central Avenue bridge (ongoing)	• The City discharges treated effluent into the Rio Grande at an average rate of about 80 cubic feet per second (cfs). The City has an agreement with the MRGCD to maintain a discharge of at least 250 cfs at the Central Bridge in Albuquerque. These actions involve water quality issues and ensure permanent flows from Cochiti Dam to Isleta Diversion Dam.

Table E-1 (continued)
Cumulative Effects Analysis -
Summary of Planned or Ongoing Projects in the Rio Grande Basin

Project	Description
5. City of Albuquerque - Seasonal effects on ground water use to meet demands (ongoing)	• The water demand for turf irrigation in Albuquerque varies by season, and is much greater in the summer than in the winter. Turf irrigators throughout the City use more water during the summer than during the winter. Peak summer seasonal demands for turf irrigation water in the project area will exceed the supply available from the City's planned water reclamation project sources. During these periods of higher demand, ground water will continue to be used as a supplementary source of turf irrigation water. However, this demand will be at reduced amounts compared to the existing situation, because of the off-setting effects of the supply of reclaimed industrial effluent water. As a result of the implementation of the proposed action, less ground water will be required, on an annual basis, for turf irrigation. The expected annual average ground water use for these activities is unquantified.
6. City of Albuquerque - Deep aquifer mining (ongoing)	• Even with implementation of the Drinking Water Supply Project (above), the City will continue to rely on ground water for part of its water supply. This continued use of ground water may continue to exceed the recharge of the ground water basin, both through natural recharge or in combination with an aquifer storage and recovery component. Even with the implementation of the Drinking Water Project and Aquifer Storage and Recovery, ground water use is expected to exceed the rate of recharge after around 2040. Therefore, additional water sources will eventually need to be identified if projected water use demands continue as estimated.
7. Bureau of Reclamation - River maintenance activities (ongoing)	• Reclamation has authority for maintenance of the river channel for the Middle Rio Grande Project from Velarde, New Mexico, to Caballo Dam. The goals of the program are: 1) to provide for the effective transport of water and sediment to Elephant Butte Reservoir; 2) to conserve surface water in the Rio Grande basin; 3) to reduce the rate of aggradation in the Rio Grande; and, 4) to protect certain riverside structures and facilities. River maintenance activities include bank stabilization/bioengineering/habitat enhancement techniques, river training works, sediment removal, vegetation control, levee maintenance, and access and construction requirements. Current projects include activities to restore native habitat, conserve threatened and endangered species, maintain bosque function and values, minimize adverse water quality effects, and allow fluvial processes to occur to the extent possible.
8. Bureau of Reclamation - Acquisition of supplemental water (ongoing)	• Since 1996, Reclamation has acquired water to provide for the survival and recovery of the Rio Grande silvery minnow. San Juan-Chama Project water has been provided to supplement the middle valley, thereby allowing the MRGCD to bypass native flows for the silvery minnow. The majority of supplemental water has been made available through contract with the City of Albuquerque (up to 30,000 acre-feet per year during 1997-1999). Reclamation continues to pursue other means to acquire the use of water for supplementing streamflow.

Table E-1 (continued)
Cumulative Effects Analysis -
Summary of Planned or Ongoing Projects in the Rio Grande Basin

Project	Description
9. Bureau of Reclamation and U.S. Army, Corps of Engineers - Upper Rio Grande Basin Water Operations Review EIS (ongoing)	• The Corps of Engineers and Bureau of Reclamation, in partnership with the State of New Mexico, will review water storage and delivery operations and may modify operations of federal river and reservoir facilities within the Upper Rio Grande Basin and develop an integrated plan. There is a need for updated NEPA and ESA compliance and a need to define procedures and protocols for review, coordination, consultation, and public involvement in water operations decisions. Early scoping is currently underway but the Notice of Intent to Prepare an EIS is not expected until late 1999. A decision document is currently scheduled for 2003. There will be intensive coordination with the City of Albuquerque's projects.
10. Bureau of Reclamation - Low Flow Conveyance Channel and Rio Grande Floodway EIS (ongoing)	• Reclamation is preparing an EIS to reevaluate the operation and configuration of the Low Flow Conveyance Channel and Rio Grande floodway between San Acacia Diversion Dam and Elephant Butte Reservoir. A draft EIS is scheduled for 1999.
11. City of Santa Fe - Water Management and Restoration Strategy EIS (planned)	• Reclamation is the lead federal agency for this EIS that encompasses the City of Santa Fe's strategy to use its contracted San Juan-Chama Project water, wastewater, and existing well fields in an integrated manner to meet potable and non-potable needs. This EIS is scheduled to begin in 1999 and be completed in 2001.
12. U.S. Army, Corps of Engineers - San Acacia Levee Project (ongoing)	• The Corps of Engineers plans to distribute a draft SEIS/Limited Re-evaluation Report for public review in December 1998. This levee rehabilitation project on the east bank of the Rio Grande extends from the San Acacia diversion dam to just north of the Tiffany Area above the San Marcial railroad bridge. The project will rehabilitate the existing spoil bank levee to withstand higher and longer duration flood events, relocate and increase the flow capacity of the San Marcial railroad bridge, and reintroduce the Tiffany area to the active floodplain. The project will allow for the safe release of higher flows from upstream flood control reservoirs. Currently, the San Marcial railroad bridge is the limiting factor restricting higher spring releases from upstream reservoirs. However, by raising the bridge thereby increasing the potential to pass higher peak flows may result in better channel dynamics and healthier riparian community.
13. U.S. Army, Corps of Engineers - Belen Levee Project (ongoing)	• The Corps of Engineers plans to distribute a draft SEIS/Limited Reevaluation Report for public review in the spring of 1999. This levee rehabilitation project extends from Isleta Pueblo to Belen, New Mexico, on both the east and west banks of the Rio Grande. The project will rehabilitate the existing spoil bank levee to withstand higher and longer duration flood events. It will allow for the safe release of higher flow from upstream flood control reservoirs. Portions of this spoil bank levee are the next limitation (after the San Marcial railroad bridge) to higher spring releases from upstream reservoirs.

Table E-1 (continued)
Cumulative Effects Analysis -
Summary of Planned or Ongoing Projects in the Rio Grande Basin

Project	Description
14. Agricultural water use (ongoing)	• Ongoing non-federal actions that are important to water resources include the ongoing agricultural use of water in the Rio Chama and middle Rio Grande valleys. Surface water is diverted directly from the Rio Chama and mainstem Rio Grande for application on farmlands. A portion of the water returns to the river via wasteways from irrigation drains. However, below San Acacia Diversion Dam, all irrigation return flows are collected in irrigation drains and the Low Flow Conveyance Channel and delivered to Elephant Butte Reservoir. This project could benefit social considerations and economic factors either by improving efficiency of water delivery, improving biological values/recreational opportunities, precluding land subsidence, protecting riverside features, protecting areas beyond levees, and agricultural fields.

Source: L. Robertson, Bureau of Reclamation, 1998 (personal communication); CH2M Hill, 1997c

cfs	cubic feet per second
EIS	Environmental Impact Statement
ESA	Endangered Species Act
mgd	million gallons per day
MRGCD	Middle Rio Grande Conservancy District
NEPA	National Environmental Policy Act
SEIS	Supplemental Environmental Impact Statement
WRSI	Water Resources Strategy Implementation

Table E-2
Determination of Potential Cumulative Effects of Planned and Ongoing Projects in the Rio Grande Basin on Environmental Resources

Resource: Groundwater Sustainability

- City of Albuquerque existing water supply system
- implementation of a drought reserve (reduced ground water use)

Resource: Surface Water Quantity

- City of Albuquerque proposed water reclamation projects (reduced stream flow)
- City Drinking Water supply project (use of 47,000 ac-ft/yr. of San Juan/Chama water and ceasing to supplement surface flows with ground water)
- agricultural water use (no change anticipated, although there could be future forbearance or change of use from agriculture to municipal/industrial)
- City of Santa Fe project (potential for less stream flow; Santa Fe will use 5,600 ac-ft San Juan-Chama water)
- low flow project (could be more efficient conveyance to Elephant Butte; could be a more open floodplain and higher losses)
- Reclamation's river maintenance program (maintains efficient transport)
- Corps' levee projects (maintains safe transport of flood flows)
- Upper Rio Grande Basin Water Operations Review EIS (better coordinated operations and improved efficiencies)

Resource: Surface Water Quality

- Reclamation's river maintenance program (some short term increase in turbidity)
- Reclamation's low flow conveyance channel EIS (sediment will be managed differently)
- agriculture water use (return flows from agriculture fields will continue to affect water quality)
- upstream discharges
- City of Albuquerque WRSI projects and ongoing actions
- Corps and Reclamation's Basin operations review (if operations are modified, there could be changes in water quality)

Resource: Biological Resources

- City of Albuquerque WRSI projects and ongoing actions (flow depletions downstream of the City's water reclamation plant and below drinking water project diversion)
- Upper Rio Grande Basin Water Operations Review EIS (higher peak flows and coordinated operations could benefit riverine and riparian habitats)

- Reclamation's low flow conveyance channel EIS (channel dynamics and the riparian community)
- Corps' San Acacia levee project (channel dynamics and the riparian community)

Resource: Social Considerations and Economic Factors

- City of Albuquerque WRSI projects (improving biological values/recreational opportunities, precluding land subsidence)
- Reclamation's river maintenance program (improving efficiency of water delivery, protecting riverside features, protecting areas beyond levees, and draining agricultural fields)
- City of Santa Fe project (improving biological values/recreational opportunities, precluding land subsidence)
- Corps' San Acacia levee and Belen levee projects (improving efficiency of water delivery, protecting riverside features, protecting areas beyond levees, and draining agricultural fields)
- Reclamation's river maintenance program (improving biological values/recreational opportunities)
- Corps' San Acacia levee and Belen levee projects (improving biological values/recreational opportunities)

Appendix F
Consultation Letters - Indian Trust Assets

ALB-153
ENV-1.10

MAR 1 6 1999

Governor Alvino Lucero
Pueblo of Isleta
PO Box 1270
Isleta NM 87022

Subject: Coordination Regarding City of Albuquerque's North I-25 Industrial Recycling Project

Dear Governor Lucero:

The U.S. Bureau of Reclamation (Reclamation) is serving as the National Environmental Policy Act (NEPA) lead Federal Agency for the City of Albuquerque's (City) North I-25 Industrial Recycling Project. Reclamation is providing some funding for this proposed project and is overseeing NEPA compliance activities. To date, several workgroup meetings have been conducted to present and discuss the City's water resources projects, including details of the Industrial Recycling Project. We have been grateful for the participation of representatives from Isleta Pueblo including Mr. Jim Piatt, Mr. Andy Padilla, Mr. Herb Becker, Ms. Charlene Seidl, Mr. John Sorrell, and Ms. Jan Sorrell.

The proposed water reclamation project in the North I-25 area near Alameda Boulevard would service a portion of the City with non-potable water that would be reclaimed from industrial uses and used for turf irrigation and industrial processes. The purpose of the proposed project is to develop a City-owned, reclaimed, non-potable water collection, disinfection, storage, and distribution system. The distribution system would be routed primarily in utility corridors along public rights-of-way. At maximum capacity, this system would replace the use of approximately 964 to 1,132 acre-feet per year (ac-ft/yr.) of ground water currently being obtained from the Santa Fe Group Aquifer System. The use of reclaimed water for non-potable purposes would preclude the need to withdraw an equivalent amount of ground water from the aquifer. The reclaimed water would be obtained from three industrial facilities (Philips Semiconductors, Sumitomo Sitix Silicon, and Silmax) that currently generate approximately 0.86 million gallons per day (mgd) or 964 ac-ft/yr. of wastewater from manufacturing processes. This volume is anticipated to increase to about 1.01 mgd (1,132 ac-ft/yr.) in the future. Approximately 72 percent of the reclaimed water would be used for turf irrigation in public use areas and for landscaping at commercial facilities. Turf irrigation would occur at up to 12 locations that collectively comprise 356 acres. The sites range from 270 acres at the Balloon Fiesta Park to 2 acres at the AMTECH site. The remaining 28 percent would be used for industrial process purposes at up to four locations. Use would range from about 168 ac-ft/yr. at the Centex/American Gypsum facility to 45 ac-ft/yr. at the Western Mobile plant.

A

Reclaimed water would be conveyed to and collected at a 1-million-gallon steel equalization reservoir that would be sited on the Honeywell property near the industrial facilities. A 9.61-mgd pump station next to the equalization reservoir would pump the reclaimed water to a storage reservoir east of I-25. At the equalization reservoir, chlorine would be added to the non-potable water to maintain a 1 milligram per liter (mg/L) residual and prevent the growth of bacteria in the system. The storage reservoir would be located on City property at the existing Coronado reservoir site between Paseo del Norte and Palomas Avenue. The distribution pipeline would be laid in a trench 5 to 6 feet deep. The trench would disturb an area approximately 4 feet wide. The pipeline within the City streets would be placed within the utilities rights-of-way and would only disturb the paved section of the street. The pipeline would be bored under many of the major road and arroyo crossings to avoid traffic disruption or the demolition and replacement of arroyo linings. Major road and arroyo crossings include Alameda Boulevard, I-25, Paseo Del Norte, and Domingo Baca Arroyo north of Tri-Gas on Jefferson Street.

As part of the NEPA consultation process for the Recycling Project, an evaluation of potential effects of the proposed project to cultural resources and Indian trust assets have been undertaken. No adverse effects have been identified by these efforts and hence, no mitigation need is foreseen. However, to assist us in fully analyzing potential effects we would appreciate your Pueblo's input regarding the proposed project. Specifically, Reclamation would like your input regarding the following:

- Identify resources or trust assets that could potentially be impacted by the proposal.
- Indicate how the proposal may affect those resources/trust assets or tribal health and safety.
- Identify the anticipated issues you believe are associated with the proposed project and the resources/assets/health and safety matters of concern.
- Indicate if our preliminary conclusions are consistent with your assessment of the proposal.

For your information and review, we are enclosing a map of the proposed project area and draft copies of reports prepared to address Indian trust assets and cultural resources. After reviewing this information, please contact us for additional information or clarification. We would welcome an opportunity to meet with you and your staff within the next week to discuss technical aspects of the proposal. If your preference is to provide written response, we would appreciate receiving your input by March 29, 1999. Please contact Ms. Lori Robertson of my staff at (505) 248-5326 to arrange a meeting or discuss the project and this request. Thank you for your time and consideration.

Sincerely,

FOR William P. Rohwer

Michael R. Gabaldon
Area Manager

Enclosures

cc: Pueblo of Isleta
Attention: Natural Resources Office
PO Box 1270
Isleta NM 87022

Mr. Rob Baracker
Area Director
Bureau of Indian Affairs
Albuquerque Area Office
PO Box 26567
Albuquerque NM 87125-6567

Florine Gutierrez
Superintendent
BIA Southern Pueblos Agency
PO Box 1667
Albuquerque NM 87103

WBR:LRobertson:mpb:3/12/99:248-5326:isleta-r.wpd

ALB-153
ENV-1.10

MAR 1 6 1999

Governor Inez Baca
Pueblo of Sandia
Box 6008
Bernalillo NM 87004

Subject: Coordination Regarding City of Albuquerque's North I-25 Industrial Recycling Project

Dear Governor Baca:

The U.S. Bureau of Reclamation (Reclamation) is serving as the National Environmental Policy Act (NEPA) lead federal agency for the City of Albuquerque's (City) North I-25 Industrial Recycling Project. Reclamation is providing some funding for this proposed project and is overseeing NEPA compliance activities. To date, several workgroup meetings have been conducted to present and discuss the City's water resources projects, including details of the Industrial Recycling Project. We have been grateful for the participation of representatives from Sandia Pueblo including Mr. Blaine Sanchez, Ms. Rhea Graham, and Ms. Beth Janello.

The proposed water reclamation project in the North I-25 area near Alameda Boulevard would service a portion of the City with non-potable water that would be reclaimed from industrial uses and used for turf irrigation and industrial processes. The purpose of the proposed project is to develop a City-owned, reclaimed, non-potable water collection, disinfection, storage, and distribution system. The distribution system would be routed primarily in utility corridors along public rights-of-way. At maximum capacity, this system would replace the use of approximately 964 to 1,132 acre-feet per year (ac-ft/yr.) of ground water currently being obtained from the Santa Fe Group aquifer system. The use of reclaimed water for non-potable purposes would preclude the need to withdraw an equivalent amount of ground water from the aquifer. The reclaimed water would be obtained from three industrial facilities (Philips Semiconductors, Sumitomo Sitix Silicon, and Silmax) that currently generate approximately 0.86 million gallons per day (mgd) or 964 ac-ft/yr. of wastewater from manufacturing processes. This volume is anticipated to increase to about 1.01 mgd (1,132 ac-ft/yr.) in the future. Approximately 72 percent of the reclaimed water would be used for turf irrigation in public use areas and for landscaping at commercial facilities. Turf irrigation would occur at up to 12 locations that collectively comprise 356 acres. The sites range from 270 acres at the Balloon Fiesta Park to 2 acres at the AMTECH site. The remaining 28 percent would be used for industrial process purposes at up to four locations. Use would range from about 168 ac-ft/yr. at the Centex/American Gypsum facility to 45 ac-ft/yr. at the Western Mobile plant.

Reclaimed water would be conveyed to and collected at a 1-million-gallon steel equalization reservoir that would be sited on the Honeywell property near the industrial facilities. A 9.61-mgd pump station next to the equalization reservoir would pump the reclaimed water to a storage reservoir east of I-25. At the equalization reservoir, chlorine would be added to the non-potable water to maintain a 1 milligram per liter (mg/L) residual and prevent the growth of bacteria in the system. The storage reservoir would be located on City property at the existing Coronado reservoir site between Paseo del Norte and Palomas Avenue. The distribution pipeline would be laid in a trench 5 to 6 feet deep. The trench would disturb an area approximately 4 feet wide. The pipeline within the City streets would be placed within the utilities rights-of-way and would only disturb the paved section of the street. The pipeline would be bored under many of the major road and arroyo crossings to avoid traffic disruption or the demolition and replacement of arroyo linings. Major road and arroyo crossings include Alameda Boulevard, I-25, Paseo Del Norte, and Domingo Baca Arroyo north of Tri-Gas on Jefferson Street.

As part of the NEPA consultation process for the Recycling Project, an evaluation of potential effects of the proposed project to cultural resources and Indian trust assets has been undertaken. No adverse effects have been identified by these efforts and, hence, no mitigation need is foreseen. However, to assist us in fully analyzing potential effects we would appreciate your Pueblo's input regarding the proposed project. Specifically, Reclamation would like your input regarding the following:

- identify resources or trust assets that could potentially be impacted by the proposal
- indicate how the proposal may affect those resources/trust assets or tribal health and safety
- identify the anticipated issues you believe are associated with the proposed project and the resources/assets/health and safety matters of concern
- indicate if our preliminary conclusions are consistent with your assessment of the proposal

For your information and review, we are enclosing a map of the proposed project area and draft copies of reports prepared to address Indian trust assets and cultural resources. After reviewing this information, please contact us for additional information or clarification. We would welcome an opportunity to meet with you and your staff within the next week to discuss technical aspects of the proposal. If your preference is to provide written response, we would appreciate receiving your input by March 29, 1999. Please contact Ms. Lori Robertson of my staff at (505) 248-5326 to arrange a meeting or discuss the project and this request. Thank you for your time and consideration.

Sincerely,

William P. Rohwer

FOR Michael R. Gabaldon
Area Manager

Enclosures

cc: Pueblo of Sandia
Attention: Natural Resources Office
Box 6008
Bernalillo NM 87004

Mr. Rob Baracker
Area Director
Bureau of Indian Affairs
Albuquerque Area Office
PO Box 26567
Albuquerque NM 87125-6567

Florine Gutierrez
Superintendent
BIA Southern Pueblos Agency
PO Box 1667
Albuquerque NM 87103

WBR:LRobertson:sjh:03/15/99:248-5326:sandia.wpd

0652

MAR 2 2 1999

ALB-153
ENV-1.10

Governor Anthony Ortiz
Pueblo of San Felipe
PO Box 4339
San Felipe Pueblo NM 87001

Subject: Coordination Regarding City of Albuquerque's North I-25 Industrial Recycling Project

Dear Governor Ortiz:

The U.S. Bureau of Reclamation (Reclamation) is serving as the National Environmental Policy Act (NEPA) lead federal agency for the City of Albuquerque's (City) North I-25 Industrial Recycling Project. Reclamation is providing some funding for this proposed project and is overseeing NEPA compliance activities. To date, several workgroup meetings have been conducted to present and discuss the City's water resources projects, including details of the Industrial Recycling Project. We have been grateful for the participation of Mr. Lawrence Troncosa from San Felipe Pueblo.

The proposed water reclamation project in the North I-25 area near Alameda Boulevard would service a portion of the City with non-potable water that would be reclaimed from industrial uses and used for turf irrigation and industrial processes. The purpose of the proposed project is to develop a City-owned, reclaimed, non-potable water collection, disinfection, storage, and distribution system. The distribution system would be routed primarily in utility corridors along public rights-of-way. At maximum capacity, this system would replace the use of approximately 964 to 1,132 acre-feet per year (ac-ft/yr.) of ground water currently being obtained from the Santa Fe Group aquifer system. The use of reclaimed water for non-potable purposes would preclude the need to withdraw an equivalent amount of ground water from the aquifer. The reclaimed water would be obtained from three industrial facilities (Philips Semiconductors, Sumitomo Sitix Silicon, and Silmax) that currently generate approximately 0.86 million gallons per day (mgd) or 964 ac-ft/yr. of wastewater from manufacturing processes. This volume is anticipated to increase to about 1.01 mgd (1,132 ac-ft/yr.) in the future. Approximately 72 percent of the reclaimed water would be used for turf irrigation in public use areas and for landscaping at commercial facilities. Turf irrigation would occur at up to 12 locations that collectively comprise 356 acres. The sites range from 270 acres at the Balloon Fiesta Park to 2 acres at the AMTECH site. The remaining 28 percent would be used for industrial process purposes at up to four locations. Use would range from about 168 ac-ft/yr. at the Centex/American Gypsum facility to 45 ac-ft/yr. at the Western Mobile plant.

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Sincerely,

Michael R. Gabaldon

Michael Gabaldon
Area Manager

Enclosures

cc: Pueblo of San Felipe
Attention: Natural Resources Office
PO Box 4339
San Felipe Pueblo NM 87001

Ms. Florine Gutierrez
Superintendent
BIA Southern Pueblos Agency
PO Box 1667
Albuquerque, NM 87103
(w/out encl)

Mr. Rob Baracker
Bureau of Indian Affairs
Albuquerque Area Office
Area Manager
PO Box 26567
Albuquerque NM 87125-6567
(w/out encl)

WBR:LRobertson:sjh:03/19/99:248-5326:snfelipe.wpd

0653

MAR 2 2 1999

ALB-153
ENV-1.10

Governor Alex Ballon
Pueblo of Santo Domingo
PO Box 99
Santo Domingo Pueblo NM 87052

Subject: Coordination Regarding City of Albuquerque's North I-25 Industrial Recycling Project

Dear Governor Ballon:

The U.S. Bureau of Reclamation (Reclamation) is serving as the National Environmental Policy Act (NEPA) lead federal agency for the City of Albuquerque's (City) North I-25 Industrial Recycling Project. Reclamation is providing some funding for this proposed project and is overseeing NEPA compliance activities. To date, several workgroup meetings have been conducted to present and discuss the City's water resources projects, including details of the Industrial Recycling Project. We have been grateful for the participation of Mr. Ernest Coriz from Santo Domingo Pueblo.

The proposed water reclamation project in the North I-25 area near Alameda Boulevard would service a portion of the City with non-potable water that would be reclaimed from industrial uses and used for turf irrigation and industrial processes. The purpose of the proposed project is to develop a City-owned, reclaimed, non-potable water collection, disinfection, storage, and distribution system. The distribution system would be routed primarily in utility corridors along public rights-of-way. At maximum capacity, this system would replace the use of approximately 964 to 1,132 acre-feet per year (ac-ft/yr) of ground water currently being obtained from the Santa Fe Group aquifer system. The use of reclaimed water for non-potable purposes would preclude the need to withdraw an equivalent amount of ground water from the aquifer. The reclaimed water would be obtained from three industrial facilities (Philips Semiconductors, Sumitomo Sitix Silicon, and Silmax) that currently generate approximately 0.86 million gallons per day (mgd) or 964 ac-ft/yr. of wastewater from manufacturing processes. This volume is anticipated to increase to about 1.01 mgd (1,132 ac-ft/yr) in the future. Approximately 72 percent of the reclaimed water would be used for turf irrigation in public use areas and for landscaping at commercial facilities. Turf irrigation would occur at up to 12 locations that collectively comprise 356 acres. The sites range from 270 acres at the Balloon Fiesta Park to 2 acres at the AMTECH site. The remaining 28 percent would be used for industrial process purposes at up to four locations. Use would range from about 168 ac-ft/yr at the Centex/American Gypsum facility to 45 ac-ft/yr at the Western Mobile plant.

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Reclaimed water would be conveyed to and collected at a 1-million-gallon steel equalization reservoir that would be sited on the Honeywell property near the industrial facilities. A 9.61-mgd pump station next to the equalization reservoir would pump the reclaimed water to a storage reservoir east of I-25. At the equalization reservoir, chlorine would be added to the non-potable water to maintain a 1 milligram per liter (mg/L) residual and prevent the growth of bacteria in the system. The storage reservoir would be located on City property at the existing Coronado reservoir site between Paseo del Norte and Palomas Avenue. The distribution pipeline would be laid in a trench 5 to 6 feet deep. The trench would disturb an area approximately 4 feet wide. The pipeline within the City streets would be placed within the utilities rights-of-way and would only disturb the paved section of the street. The pipeline would be bored under many of the major road and arroyo crossings to avoid traffic disruption or the demolition and replacement of arroyo linings. Major road and arroyo crossings include Alameda Boulevard, I-25, Paseo Del Norte, and Domingo Baca Arroyo north of Tri-Gas on Jefferson Street.

As part of the NEPA consultation process for the Recycling Project, an evaluation of potential effects of the proposed project to cultural resources and Indian trust assets has been undertaken. No adverse effects have been identified by these efforts and, hence, no mitigation need is foreseen. However, to assist us in fully analyzing potential effects we would appreciate your Pueblo's input regarding the proposed project. Specifically, Reclamation would like your input regarding the following:

- identify resources or trust assets that could potentially be impacted by the proposal
- indicate how the proposal may affect those resources/trust assets or tribal health and safety
- identify the anticipated issues you believe are associated with the proposed project and the resources/assets/health and safety matters of concern
- indicate if our preliminary conclusions are consistent with your assessment of the proposal

For your information and review, we are enclosing a map of the proposed project area and draft copies of reports prepared to address Indian trust assets and cultural resources. After reviewing this information, please contact us for additional information or clarification. We would welcome an opportunity to meet with you and your staff within the next week to discuss technical aspects of the proposal. If your preference is to provide written response, we would appreciate receiving your input by March 29, 1999. Please contact Ms. Lori Robertson of my staff at (505) 248-5326 to arrange a meeting or discuss the project and this request. Thank you for your time and consideration.

Sincerely,

Michael R. Gabaldon

Michael Gabaldon
Area Manager

Enclosures

cc: Pueblo of Santo Domingo
Attention: Natural Resources Office
PO Box 99
Pueblo of Santo Domingo, NM 87052

Ms. Florine Gutierrez
Superintendent
BIA Southern Pueblos Agency
PO Box 1667
Albuquerque, NM 87103
(w/out encl)

Mr. Rob Baracker
Bureau of Indian Affairs
Albuquerque Area Office
Area Manager
PO Box 26567
Albuquerque NM 87125-6567
(w/out encl)

WBR:LRobertson:sjh:03/19/99:248-5326:domingo.wpd

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MAR 2 2 1999

ALB-153
ENV-1.10

Governor Isaac Herrera
Pueblo of Cochiti
PO Box 70
Cochiti NM 87072

Subject: Coordination Regarding City of Albuquerque's North I-25 Industrial Recycling Project

Dear Governor Herrera:

The U.S. Bureau of Reclamation (Reclamation) is serving as the National Environmental Policy Act (NEPA) lead federal agency for the City of Albuquerque's (City) North I-25 Industrial Recycling Project. Reclamation is providing some funding for this proposed project and is overseeing NEPA compliance activities. To date, several workgroup meetings have been conducted to present and discuss the City's water resources projects, including details of the Industrial Recycling Project. We have been grateful for the participation of representatives from Cochiti Pueblo including Mr. Andy Quintana, Mr. Donald Suina .

The proposed water reclamation project in the North I-25 area near Alameda Boulevard would service a portion of the City with non-potable water that would be reclaimed from industrial uses and used for turf irrigation and industrial processes. The purpose of the proposed project is to develop a City-owned, reclaimed, non-potable water collection, disinfection, storage, and distribution system. The distribution system would be routed primarily in utility corridors along public rights-of-way. At maximum capacity, this system would replace the use of approximately 964 to 1,132 acre-feet per year (ac-ft/yr.) of ground water currently being obtained from the Santa Fe Group aquifer system. The use of reclaimed water for non-potable purposes would preclude the need to withdraw an equivalent amount of ground water from the aquifer. The reclaimed water would be obtained from three industrial facilities (Philips Semiconductors, Sumitomo Sitix Silicon, and Silmax) that currently generate approximately 0.86 million gallons per day (mgd) or 964 ac-ft/yr. of wastewater from manufacturing processes. This volume is anticipated to increase to about 1.01 mgd (1,132 ac-ft/yr.) in the future. Approximately 72 percent of the reclaimed water would be used for turf irrigation in public use areas and for landscaping at commercial facilities. Turf irrigation would occur at up to 12 locations that collectively comprise 356 acres. The sites range from 270 acres at the Balloon Fiesta Park to 2 acres at the AMTECH site. The remaining 28 percent would be used for industrial process purposes at up to four locations. Use would range from about 168 ac-ft/yr. at the Centex/American Gypsum facility to 45 ac-ft/yr. at the Western Mobile plant.

A

Reclaimed water would be conveyed to and collected at a 1-million-gallon steel equalization reservoir that would be sited on the Honeywell property near the industrial facilities. A 9.61-mgd pump station next to the equalization reservoir would pump the reclaimed water to a storage reservoir east of I-25. At the equalization reservoir, chlorine would be added to the non-potable water to maintain a 1 milligram per liter (mg/L) residual and prevent the growth of bacteria in the system. The storage reservoir would be located on City property at the existing Coronado reservoir site between Pasco del Norte and Palomas Avenue. The distribution pipeline would be laid in a trench 5 to 6 feet deep. The trench would disturb an area approximately 4 feet wide. The pipeline within the City streets would be placed within the utilities rights-of-way and would only disturb the paved section of the street. The pipeline would be bored under many of the major road and arroyo crossings to avoid traffic disruption or the demolition and replacement of arroyo linings. Major road and arroyo crossings include Alameda Boulevard, I-25, Paseo Del Norte, and Domingo Baca Arroyo north of Tri-Gas on Jefferson Street.

As part of the NEPA consultation process for the Recycling Project, an evaluation of potential effects of the proposed project to cultural resources and Indian trust assets has been undertaken. No adverse effects have been identified by these efforts and, hence, no mitigation need is foreseen. However, to assist us in fully analyzing potential effects we would appreciate your Pueblo's input regarding the proposed project. Specifically, Reclamation would like your input regarding the following:

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- indicate how the proposal may affect those resources/trust assets or tribal health and safety
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- indicate if our preliminary conclusions are consistent with your assessment of the proposal

For your information and review, we are enclosing a map of the proposed project area and draft copies of reports prepared to address Indian trust assets and cultural resources. After reviewing this information, please contact us for additional information or clarification. We would welcome an opportunity to meet with you and your staff within the next week to discuss technical aspects of the proposal. If your preference is to provide written response, we would appreciate receiving your input by March 26, 1999. Please contact Ms. Lori Robertson of my staff at (505) 248-5326 to arrange a meeting or discuss the project and this request. Thank you for your time and consideration.

Sincerely,

Michael Gabaldon
Area Manager

Enclosures

cc: Pueblo of Cochiti
Attention: Natural Resources Office
PO Box 70
Cochiti NM 87072

Ms. Florine Gutierrez
Superintendent
BIA Southern Pueblos Agency
PO Box 1667
Albuquerque, NM 87103
(w/out encl)

Mr. Rob Baracker
Bureau of Indian Affairs
Albuquerque Area Office
Area Manager
PO Box 26567
Albuquerque NM 87125-6567
(w/out encl)

WBR:LRobertson:sjh:03/19/99:248-5326:cochiti.wpd

ALB-153
ENV-1.10

MAR 2 2 1999

Governor Bruce Sanchez
Pueblo of Santa Ana
2 Dove Road
Bernalillo NM 87004

Subject: Coordination Regarding City of Albuquerque's North I-25 Industrial Recycling Project

Dear Governor Sanchez:

The U.S. Bureau of Reclamation (Reclamation) is serving as the National Environmental Policy Act (NEPA) lead federal agency for the City of Albuquerque's (City) North I-25 Industrial Recycling Project. Reclamation is providing some funding for this proposed project and is overseeing NEPA compliance activities. To date, several workgroup meetings have been conducted to present and discuss the City's water resources projects, including details of the Industrial Recycling Project. We have been grateful for the participation of representatives from Santa Ana Pueblo including Mr. Les Ramirez, Mr. Joey Sanchez, Mr. Les Taylor, and Mr. Todd Caplan.

The proposed water reclamation project in the North I-25 area near Alameda Boulevard would service a portion of the City with non-potable water that would be reclaimed from industrial uses and used for turf irrigation and industrial processes. The purpose of the proposed project is to develop a City-owned, reclaimed, non-potable water collection, disinfection, storage, and distribution system. The distribution system would be routed primarily in utility corridors along public rights-of-way. At maximum capacity, this system would replace the use of approximately 964 to 1,132 acre-feet per year (ac-ft/yr.) of ground water currently being obtained from the Santa Fe Group aquifer system. The use of reclaimed water for non-potable purposes would preclude the need to withdraw an equivalent amount of ground water from the aquifer. The reclaimed water would be obtained from three industrial facilities (Philips Semiconductors, Sumitomo Sitix Silicon, and Silmax) that currently generate approximately 0.86 million gallons per day (mgd) or 964 ac-ft/yr. of wastewater from manufacturing processes. This volume is anticipated to increase to about 1.01 mgd (1,132 ac-ft/yr.) in the future. Approximately 72 percent of the reclaimed water would be used for turf irrigation in public use areas and for landscaping at commercial facilities. Turf irrigation would occur at up to 12 locations that collectively comprise 356 acres. The sites range from 270 acres at the Balloon Fiesta Park to 2 acres at the AMTECH site. The remaining 28 percent would be used for industrial process purposes at up to four locations. Use would range from about 168 ac-ft/yr. at the Centex/American Gypsum facility to 45 ac-ft/yr. at the Western Mobile plant.

Reclaimed water would be conveyed to and collected at a 1-million-gallon steel equalization reservoir that would be sited on the Honeywell property near the industrial facilities. A 9.61-mgd pump station next to the equalization reservoir would pump the reclaimed water to a storage reservoir east of I-25. At the equalization reservoir, chlorine would be added to the non-potable water to maintain a 1 milligram per liter (mg/L) residual and prevent the growth of bacteria in the system. The storage reservoir would be located on City property at the existing Coronado reservoir site between Paseo del Norte and Palomas Avenue. The distribution pipeline would be laid in a trench 5 to 6 feet deep. The trench would disturb an area approximately 4 feet wide. The pipeline within the City streets would be placed within the utilities rights-of-way and would only disturb the paved section of the street. The pipeline would be bored under many of the major road and arroyo crossings to avoid traffic disruption or the demolition and replacement of arroyo linings. Major road and arroyo crossings include Alameda Boulevard, I-25, Paseo Del Norte, and Domingo Baca Arroyo north of Tri-Gas on Jefferson Street.

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Sincerely,

Michael R. Gabaldon

Michael Gabaldon
Area Manager

Enclosures

cc: Pueblo of Santa Ana
Attention: Natural Resources Office
2 Dove Road
Bernalillo NM 87052

Ms. Florine Gutierrez
Superintendent
BIA Southern Pueblos Agency
PO Box 1667
Albuquerque, NM 87103
(w/out encl)

Mr. Rob Baracker
Bureau of Indian Affairs
Albuquerque Area Office
Area Manager
PO Box 26567
Albuquerque NM 87125-6567
(w/out encl)

WBR:LRobertson:sjh:03/19/99:248-5326:santaana.wpd

MAR 16 1999

ALB-153
ENV-1.10

Rob Baracker
Bureau of Indian Affairs
Albuquerque Area Office
Area Manager
PO Box 26567
Albuquerque NM 87125-6567

Subject: Coordination Regarding City of Albuquerque's North I-25 Industrial Recycling Project

Dear Mr Baracker:

The U.S. Bureau of Reclamation (Reclamation) is serving as the National Environmental Policy Act (NEPA) lead federal agency for the City of Albuquerque's (City) North I-25 Industrial Recycling Project. Reclamation is providing some funding for this proposed project and is overseeing NEPA compliance activities. To date, several workgroup meetings have been conducted to present and discuss the City's water resources projects, including details of the Industrial Recycling Project. We have been grateful for the participation of Mr. Art Martinez representing your office.

The proposed water reclamation project in the North I-25 area near Alameda Boulevard would service a portion of the City with non-potable water that would be reclaimed from industrial uses and used for turf irrigation and industrial processes. The purpose of the proposed project is to develop a City-owned, reclaimed, non-potable water collection, disinfection, storage, and distribution system. The distribution system would be routed primarily in utility corridors along public rights-of-way. At maximum capacity, this system would replace the use of approximately 964 to 1,132 acre-feet per year (ac-ft/yr.) of ground water currently being obtained from the Santa Fe Group aquifer system. The use of reclaimed water for non-potable purposes would preclude the need to withdraw an equivalent amount of ground water from the aquifer. The reclaimed water would be obtained from three industrial facilities (Philips Semiconductors, Sumitomo Sitix Silicon, and Silmax) that currently generate approximately 0.86 million gallons per day (mgd) or 964 ac-ft/yr. of wastewater from manufacturing processes. This volume is anticipated to increase to about 1.01 mgd (1,132 ac-ft/yr.) in the future. Approximately 72 percent of the reclaimed water would be used for turf irrigation in public use areas and for landscaping at commercial facilities. Turf irrigation would occur at up to 12 locations that collectively comprise 356 acres. The sites range from 270 acres at the Balloon Fiesta Park to 2 acres at the AMTECH site. The remaining 28 percent would be used for industrial process purposes at up to four locations. Use would range from about 168 ac-ft/yr. at the Centex/American Gypsum facility to 45 ac-ft/yr. at the Western Mobile plant.

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Sincerely,

William P. Rohwer

FOR Michael R. Gabaldon
Area Manager

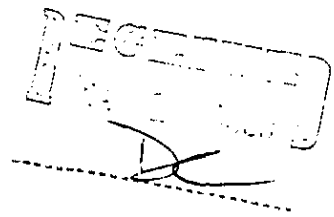
Enclosures

cc: Florine Gutierrez
Superintendent
BIA Southern Pueblos Agency
PO Box 1667
Albuquerque NM 87103

WBR:LRobertson:sjh:03/15/99:248-5326:bia_area.wpd

ALB-153
ENV-1.10

MAR 1 6 1999



Florine Gutierrez
Superintendent
BIA Southern Pueblos Agency
PO Box 1667
Albuquerque NM 87103

Subject: Coordination Regarding City of Albuquerque's North I-25 Industrial Recycling Project

Dear Ms. Gutierrez:

The U.S. Bureau of Reclamation (Reclamation) is serving as the National Environmental Policy Act (NEPA) lead federal agency for the City of Albuquerque's (City) North I-25 Industrial Recycling Project. Reclamation is providing some funding for this proposed project and is overseeing NEPA compliance activities. To date, several workgroup meetings have been conducted to present and discuss the City's water resources projects, including details of the Industrial Recycling Project. We have been grateful for the recent participation of Mr. James Vallie representing your office.

The proposed water reclamation project in the North I-25 area near Alameda Boulevard would service a portion of the City with non-potable water that would be reclaimed from industrial uses and used for turf irrigation and industrial processes. The purpose of the proposed project is to develop a City-owned, reclaimed, non-potable water collection, disinfection, storage, and distribution system. The distribution system would be routed primarily in utility corridors along public rights-of-way. At maximum capacity, this system would replace the use of approximately 964 to 1,132 acre-feet per year (ac-ft/yr.) of ground water currently being obtained from the Santa Fe Group aquifer system. The use of reclaimed water for non-potable purposes would preclude the need to withdraw an equivalent amount of ground water from the aquifer. The reclaimed water would be obtained from three industrial facilities (Philips Semiconductors, Sumitomo Sitix Silicon, and Silmax) that currently generate approximately 0.86 million gallons per day (mgd) or 964 ac-ft/yr. of wastewater from manufacturing processes. This volume is anticipated to increase to about 1.01 mgd (1,132 ac-ft/yr.) in the future. Approximately 72 percent of the reclaimed water would be used for turf irrigation in public use areas and for landscaping at commercial facilities. Turf irrigation would occur at up to 12 locations that collectively comprise 356 acres. The sites range from 270 acres at the Balloon Fiesta Park to 2 acres at the AMTECH site. The remaining 28 percent would be used for industrial process purposes at up to four locations. Use would range from about 168 ac-ft/yr. at the Centex/American Gypsum facility to 45 ac-ft/yr. at the Western Mobile plant.

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Sincerely,

FOR William P. Rohwer

Michael R. Gabaldon
Area Manager

Enclosures

cc: Rob Baracker
Bureau of Indian Affairs
Albuquerque Area Office
Area Manager
PO Box 26567
Albuquerque NM 87125-6567
(w/out encl)

WBR:LRobertson:sjh:03/15/99:248-5326:bia_agen.wpd

Appendix G
Consultation Letter - Endangered Species Act Section 7

United States Department of the Interior

BUREAU OF RECLAMATION
Albuquerque Area Office
505 Marquette NW, Suite 1313
Albuquerque, New Mexico 87102-2162

IN REPLY REFER TO:
ALB-153
ENV-1.10

APR 2 9 1999

Ms. Jennifer Fowler-Propst
Field Supervisor
U.S. Fish and Wildlife Service
Ecological Services
2105 Osuna NE
Albuquerque NM 87113

Subject: Informal Section 7 Consultation Regarding City of Albuquerque Industrial Recycling Project

Dear Ms. Fowler-Propst:

Thank you for your memo dated March 10, 1999, in which you agreed to consult informally with the U.S. Bureau of Reclamation Albuquerque Area Office (Reclamation) on the City of Albuquerque's (City) North I-25 Industrial Recycling Project. Reclamation agrees that the impacts of this proposed action to the Rio Grande Silvery Minnow and its proposed critical habitat must be addressed specifically for the proposed action. In light of our mutual understanding, we have modified our proposed action to include additional environmental protection measures that will mitigate any potential adverse effects to the Silvery Minnow. Some of the discussion that follows is repetitive of our January 4, 1999, letter to you, however, there is some new information regarding long-term effects and environmental protection measures specific to the Industrial Recycling Project.

PROPOSED ACTION

The City proposes to develop a water reclamation project in the North I-25 area near Alameda to service a portion of the City with non-potable water that would be reclaimed from industrial uses and used for turf irrigation and industrial processes. The purpose of the proposed project is to develop a City-owned, reclaimed, non-potable water collection, disinfection, storage, and distribution system. At maximum capacity, this system would replace the use of approximately 964 to 1,132 acre-feet per year (ac-ft/yr.) of ground water currently being obtained from the Santa Fe Group aquifer system. The use of reclaimed water for non-potable purposes would preclude the need to withdraw an equivalent amount of ground water from the aquifer. The reclaimed water would be obtained from three industrial facilities that currently generate approximately 0.86 million gallons per day (mgd) or 964 ac-ft/yr. of wastewater from manufacturing processes. This volume is anticipated to increase to about 1.01 mgd (1,132 ac-ft/yr.) in the future. Approximately 72 percent

of the reclaimed water would be used for turf irrigation in public use areas and for landscaping at commercial facilities. Turf irrigation would occur at up to 12 locations that collectively comprise 356 acres. The sites range from 270 acres at the Balloon Fiesta Park to 2 acres at the AMTECH site. The remaining 28 percent would be used for industrial process purposes at up to four locations. Use would range from about 168 ac-ft/yr. at the Centex/American Gypsum facility to 45 ac-ft/yr. at the Western Mobile plant. Users of the recycled water will retain connections to the City's existing water system or to their own deep wells to insure that water is available for their uses if the recycled water system cannot provide the water required, either due to system failure or recycled water availability. The operational life of the proposed project is assumed to be 50 years.

The proposed action would build a system to collect, convey, and distribute the reclaimed water to users, routing the distribution system primarily in utility corridors along public rights-of-way. Reclaimable wastewater would be provided by three industrial users: Philips Semiconductors, Sumitomo Sitix Silicon, and Silmax. Together, it is estimated that these industries could provide a total average of up to 1,132 ac-ft/yr. of semiconductor chip and silicon wafer processing wash water for reuse. These annual volumes are based on average daily flows of 1.01 mgd. During periods of low reclaimed water demand, excess process wastewater from the semiconductor companies would continue to be sent to the City wastewater treatment plant (around 240 ac-ft/yr on average) for processing and discharge to the river. The process wastewater from these facilities currently is managed in this manner. Therefore, all of the connections and treatment capacity are already in place.

Reclaimed water would be conveyed and collected at a 1-million-gallon steel equalization reservoir that would be sited on the Honeywell property near the industrial facilities. A 9.61-mgd pump station next to the equalization reservoir would pump the reclaimed water to a storage reservoir east of I-25. The pump station would be housed in a 2,200-square-foot, roofed structure. The pump building and the equalization reservoir would occupy about 1 acre of land. The building would be architecturally compatible with the surrounding area. At the equalization reservoir, chlorine would be added to the non-potable water to maintain a 1 milligram per liter (mg/L) residual and prevent the growth of bacteria in the system. The storage reservoir would be located on City property at the existing Coronado reservoir site between Paseo del Norte and Palomas Avenue. This location presently contains an 5-million-gallon drinking water storage reservoir, which is not part of the proposed project. The 2.5-million gallon reclaimed water storage reservoir would be 32 feet high and 115 feet in diameter. It would disturb approximately 1 acre. Water would be released from the reclaimed water storage reservoir to meet peak demands. The high elevation of the reservoir would establish the hydraulic gradient required to move the water by gravity to the areas of use.

The distribution piping would range in diameter from 8 inches to 24 inches. The pipelines would be constructed of such materials as ductile iron, polyvinyl chloride (PVC), or concrete cylinder pipe. The pipelines would be differentiated from potable water lines by being purple in color, in conformance with the industry standard. The pipeline would be laid in a trench 5 to 6 feet deep. The trench would disturb an area approximately 4 feet wide. The pipeline within the City streets would be placed within the utilities rights-of-way and would only disturb the paved section of the street. The pipeline would be bored under many of the major road and arroyo crossings to avoid

traffic disruption or the demolition and replacement of arroyo linings. Major road and arroyo crossings include Alameda, I-25, Paseo Del Norte, and Domingo Baca Arroyo north of Tri-Gas on Jefferson Street. The entire alignment would be in public rights-of-way.

Environmental protection measures that consider resources such as cultural resources, groundwater quality, reclaimed water quality, air quality, soils, traffic and noise, and human health and safety will be detailed in an Environmental Assessment of the proposed project. Other environmental protection measures, related to the Rio Grande Silvery Minnow, to be incorporated into design and construction include the following.

- The City will develop and maintain an accounting system to monitor total groundwater savings and total reduction of treated wastewater effluent discharged to Rio Grande.
- The City will implement a winter habitat enhancement measure that consists of constructing and monitoring in-stream habitat features for the Rio Grande silvery minnow. Details of the enhancement measure are provided in the enclosed document "Description of Proposed Rio Grande Silvery Minnow Winter Habitat Enhancement Measure For City of Albuquerque North I-25 Industrial Recycling Project".

As referenced in your March 10, 1999, memo, to provide a more efficient and comprehensive analysis of effects of future proposed actions on the Rio Grande silvery minnow, the City would also like to 1) combine the environmental analyses for the Northside Impaired Surface Water Reuse Project and the Southside Water Reclamation Plant Effluent Reuse into one NEPA process and document; and 2) adjust the planning schedules such that the reclamation and reuse document and the City's Drinking Water Supply Environmental Impact Statement (EIS) will proceed on parallel paths recognizing that the reuse document is scheduled for completion approximately one year prior to the draft EIS.

ENDANGERED SPECIES ANALYSIS

The proposed action should have no effect on any federally listed threatened or endangered species with the exception of the Rio Grande Silvery Minnow. With respect to potential effects on the Rio Grande Silvery Minnow, the main issue of concern is change in the quantity and seasonal dynamics of the stream flow.

The proposed project will benefit the sustainable use of the Sante Fe Group aquifer. If the aquifer continues to be depleted, the results could be very undesirable. Without foresight and proper planning, the human population would continue to grow and increase its dependency on a groundwater supply with known limits. If a groundwater shortage occurred in the future to the extent of threatening human health and safety, it is likely that excess surface water would be diverted for municipal use. This type of situation would cause an adverse impact on the Silvery Minnow.

The alternative is to manage water resources in a sustainable manner. However, in order to reach that goal, there may be effects on Rio Grande surface flows since aquifer mining has been

supplementing surface flow. The use of reclaimed water as proposed, instead of resulting in discharge of the industrial effluent to the City's wastewater treatment plant, would result in less water being treated and discharged to the Rio Grande compared to current practices. The following table shows how the reduction varies seasonally and the net annual reduction.

PROPOSED PROJECT EFFECT ON RIO GRANDE FLOWS

Month	Total Average Project Non-Potable Demand[a/] (cfs)[d/]	(AFM)	Reduction in Water Returned to the River[b/] (cfs)	(AFM)	Monthly Average Flows – Rio Grande at Albuquerque Gage (cfs)[c/]	Reduction in Monthly Average Flow Due to Water Not Returned (percent)
January	0.56	33.6	0.28	16.8	900	0.03%
February	0.66	39.2	0.33	19.6	1,000	0.03%
March	1.20	73.1	0.60	36.6	1,170	0.05%
April	1.55	93.3	0.77	46.7	2,000	0.04%
May	1.55	93.3	0.77	46.7	3,170	0.02%
June	1.55	93.3	0.77	46.7	2,670	0.03%
July	1.55	93.3	0.77	46.7	1,370	0.06%
August	1.55	93.3	0.77	46.7	840	0.09%
September	1.55	93.3	0.77	46.7	500	0.15%
October	1.55	93.3	0.77	46.7	420	0.18%
November	0.66	56.2	0.47	28.1	580	0.08%
December	0.56	33.6	0.21	16.8	1,000	0.03%
Annual Total		889.2		444.6		

a/ Combined monthly turf irrigation and industrial use reclaimed water volume
b/ Net water used for reclaimed water project that is not returned to the river at the discharge point below Rio Bravo.
c/ Rio Grande at Albuquerque Gage, 1956-1995
d/ cfs = cubic feet per second. AFM - acre-feet per month.
(Columns may not total due to rounding)

The reduction in flows to be returned to the Rio Grande downstream of the wastewater treatment plant (approximately 1/4 mile below Rio Bravo) is estimated to range from 0.28 to 0.77 cfs. The reduction is greater during non-winter months because of greater demand for and use of non-potable supply. The total annual reduction in volume of flows is estimated to around 445 ac-ft.

Less wastewater delivered to and discharged from the Southside water reclamation plant could impart a minor benefit to water quality in the Rio Grande because there would be reduced wastewater effluent. However, the slight reduction of 445 ac-ft on an annual basis will not cause any measurable or detectable improvement in water quality because river flows are much greater.

Since reclaimed water will be used rather than groundwater, there should be some benefit to the aquifer. It is estimated that around 890 ac-ft less groundwater would be pumped annually. Over the 50

year operational life of the proposed project, that equates to about 44,500 ac-ft. However, in the context of that time frame, the magnitude of the aquifer, the quantities of groundwater that will continue to be pumped, and the amount of naturally occurring recharge, it may not be a significant benefit.

The above table shows that average flows in the Rio Grande are at their lowest during the month of October (420 cfs) and that the estimated reduction in water returned to the river (due to the proposed project) is at its highest (0.77 cfs). This equates to a flow reduction of about 0.18%. As noted above, throughout the year flows are estimated to be reduced by 0.28 to 0.77 cfs. A reduction of 0.28-0.77 cfs through the Albuquerque reach is not measurable. A reduction of this magnitude would not cause a detectable change in water surface elevation, water velocity, or aquatic habitat.

The average annual inflow into the middle Rio Grande valley, as measured at the Otowi gage from 1895 to1985 is about 1,050,000 ac-ft; at San Marcial the average annual flow is 820,000 ac-ft (Bosque Biological Management Plan, 1993). The proposed project is estimated to reduce the average annual volume by approximately 445 ac-ft below the wastewater treatment plant. If this volume reduction is compared to the average annual flow downstream at San Marcial, there is a decrease of approximately 0.05%.

Although on an annual basis the decrease in streamflow is minuscule, over the projected life of the project (50 years), it could cause a decrease of about 22,250 ac-ft. Again, however, in the context of future basin flows over the same time period (57.4 million ac-ft at San Marcial gage) this remains a decrease of only about 0.05%.

An integral part of the proposed project is an accounting system to inventory and monitor hydrologic effects. The City will account for all groundwater saved and the concomitant decrease in wastewater returns to the Southside water reclamation plant.

As an enhancement measure for the Rio Grande silvery minnow, the City will construct and monitor winter habitat features (see enclosure). This effort is intended to improve winter survival of the Rio Grande Silvery Minnow and assist in the understanding of winter habitat and its use by the Silvery Minnow.

EFFECT DETERMINATION

Reclamation has intensively examined the ramifications of the proposed project. The effects of the proposed recycling project on the Rio Grande Silvery Minnow are considered to be minor based on the anticipated changes in water supply and flow conditions in the river. Flows of the Rio Grande will be reduced to an extent that is not measurable or detectable. Hence, there is no measurable change in aquatic habitat. The proposed construction and monitoring of Rio Grande Silvery Minnow winter habitat will provide some benefit to the species. Based on this analysis of effects and the City's commitment to the aforementioned environmental protection measures, we conclude that the proposed project may affect but would not adversely affect the Rio Grande Silvery Minnow and would not destroy or adversely modify its proposed critical habitat.

Reclamation respectfully requests a response from your office regarding our determination. We would appreciate a response at your earliest convenience but no later than May 5, 1999. Thank you for your assistance. If you should have any questions or would like to meet to further discuss the proposed project, please contact Ms. Lori Robertson of my staff at (505) 248-5326.

Sincerely,

for Michael R. Gabaldon
Area Manager

Enclosure

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DESCRIPTION OF RIO GRANDE SILVERY MINNOW WINTER HABITAT ENHANCEMENT MEASURE FOR CITY OF ALBUQUERQUE NORTH I-25 INDUSTRIAL RECYCLING PROJECT

APRIL 26, 1999

Purpose - The purpose of the Rio Grande silvery minnow (RGSM) habitat enhancement measure is to mitigate for a potential loss of 448 acre-feet of return flows that are currently discharged from the City's Water Reclamation Plant to the Rio Grande. The potential loss of return flows is a result of reuse of industrial effluent from local industries in the North I-25 area of Albuquerque for turf irrigation and other purposes.

Objective - Create RGSM winter habitat structures in selected reaches of the river. This habitat enhancement measure would provide a physical component of the aquatic system that has been identified as important to the winter survival of the species. This component also appears to be available in only limited quantities. Winter habitat structures will be created using a variety of approaches, sizes, and configurations in order to help determine the most useful design and microsite location.

Concept - This concept would involve placing and anchoring several types and sizes of habitat structures in the river. These structures would range in size from large tree root masses to small debris piles that occupy somewhere on the order of 0.5 to 1.0 square meters of area. Structures would be placed in a variety of river physical settings in order to identify the most useful designs and locations. Location preferences would favor areas that are currently devoid of such structure, but that normally retain sufficient water depths and velocities during winter months to accommodate minnow use.

Scale - Locate and place 1 to 2 tree root masses in an area considered potentially occupied during the winter months. The size of the root masses will be patterned after those that have been identified in previous habitat evaluation studies as supporting RGSM winter season use. Also locate 10 smaller structures in other locations that would either catch and hold debris carried by the river current or that would hold debris in the water to function as habitat.

Design - The design would emulate conditions of root masses that are known to support RGSM winter season use. It is anticipated that root masses would be several feet in diameter and would remain attached to 10 to 20 feet of a tree trunk that retains several stout branch stubs. The trunk would be buried or anchored in the riverbed to prevent the structure from being washed out in a normal or moderately high runoff year. Root masses would probably be salvaged from other construction activities occurring in the City or surrounding areas.

The smaller structures would be constructed of steel posts and hardware cloth that could be constructed and installed without the use of heavy construction equipment. The design and configuration of these smaller structures would vary but would probably range from 0.5 to 1.0 square meter in size. Some would be located near a tree root mass.

Performance Evaluation - Enhancement would be demonstrated by making follow-up winter season inspections of the enhancement structures. Presence of minnows in/at the structures would be evidence of potential habitat creation/enhancement. Six sampling sessions would be completed during the winter months of December, January, and February when minnow use would be expected. Field monitoring of structure use by the RGSM would be spaced at approximately 14-day intervals. All specimens would be returned to the water unharmed immediately following identification verification. Sampling would be performed for 2 winter season (winters of 1999-2000 and 2000-2001).

A total of 12 monitoring sessions are proposed. It is anticipated that sampling of all structures during a single session could be accomplished in 1 day by 2 biologists. Compiling the collection data and completing a field report would require another day of effort.

Location - The City proposes using a reach of the Rio Grande channel for this program adjacent to its 40-acre site located on the west bank of the Rio Grande a short distance north of the Montano Bridge. Following a site inspection conducted with representatives of the U.S. Fish and Wildlife Service and Bureau of Reclamation, this area was considered suitable for the habitat enhancement program.

Coordination and Permitting – The City will complete the required local, state, and federal coordination to ensure the enhancement measures can be installed as planned. Coordination will include but not be limited to all City departments, State Engineer, MRGCD, and Corps of Engineers. A Section 404 nationwide permit may be required to authorize placement of the structures in the river channel. This will be confirmed and the City would acquire the necessary permit or authorization. The appropriate approvals will be received from both the U.S. Fish and Wildlife Service and the New Mexico Game and Fish Department authorizing the temporary confinement of RGSM specimens.

Implementation Schedule - The proposed work would be completed in 1999, contingent on the successful completion of the NEPA EA process for the referenced project. Habitat installation would be completed in 2 weeks once authorization to proceed was given and the necessary permits and approvals were received. The target date for completing installation of the structures is November 1, 1999. Field monitoring of the structures would be conducted from December 1, 1999 to March 31, 2000 and from December1, 2000 to March 31, 2001.

Comments -

Other aspects of the proposed plan important to overall plan consideration include the following:

1. Winter season holding habitat availability is an environmental feature identified by research as a potential limiting RGSM habitat factor.

2. The scale of implementing this activity would be in line with the quantity of potential water depletion associated with the first water recycling project.

3. Details of the configuration of habitat structures would be worked out with USFWS and Reclamation technical staff as additional information regarding habitat structure configuration, size, and placement are obtained from other RGSM investigations.

4. Structure design and placement will be conducted recognizing the need to protect the safety of other river channel users.